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THE HISTORY OF THE PREVENTION OF PUERPERAL FEVER*

BY

MILES H. PHILLIPS, M.D. (Hon.), B.S., F.R.C.S., F.C.O.G.

Emeritus Professor of Obstetrics and Gynaecology, University of Sheffield

This title having proved too ambitious a one for a lecture of an hour's duration, I have found it necessary to restrict my subject to a theme which can be indicated by the following words from Geoffrey Chaucer's *Canterbury Tales*—the words, written in 1389, with which the Manciple admonishes the drunken cook:

> "Hoold cloos thy mouth man
> Thy cursed breeth infecte wole [will] us alle."

Consideration of the study of the development of a therapeutic or a prophylactic measure will often be found to strengthen our intention to employ the measure in question.

The Principle of Contagion

The history of the prophylactic measure which I shall later on advocate may be held to begin about the middle of the nineteenth century. At that time a fundamental principle, that of contagion, was at last accepted by most of the leading obstetricians of the day. This theory had been long since suggested by Alexander Hamilton, in 1781, demonstrated by Alexander Gordon, in 1795, and more recently supported by Oliver Wendell Holmes, in 1843. It suits my purpose to cite only one of these converted authorities, one who had already conferred a great boon on parturient women by the introduction of chloroform.

In the discussion which followed a paper on puerperal fever read by Dr. Arneth of Vienna before the Medico-Chirurgical Society of Edinburgh on April 16, 1851, Dr. James Y. Simpson said: "But in this country we do not believe that the disease is usually propagated directly from individual to individual, but indirectly, through the medium of a third person; and that person generally the medical attendant or nurse." In the same speech Simpson confesses that in 1836, when he had his first experience of puerperal sepsis in his own practice, he had "no full and proper belief in the contagious propagation of puerperal fever." Otherwise, he leads us to infer, he would not have gone from active participation in necropsies in two cases of fatal puerperal sepsis to four cases of midwifery, all of which became infected.

It should especially interest a Manchester audience, and particularly those who are members of the staff of St. Mary's Maternity Hospital, to hear or recall that Simpson had been not a little influenced by reading an account of an outbreak of puerperal sepsis in the district maternity practice of the Manchester Lying-In Charity—the forerunner of the present-day St. Mary's Maternity Hospital. Simpson had read of this in a letter published in the *London Medical Gazette* in 1832—under the heading "Is Puerperal Fever Infectious?"—by Dr. John Roberton.

Dr. Roberton was appointed to the hospital staff in 1827, and he was the last member to bear the title of man-midwife, this being changed to surgeon in 1828. His letter had been written in response to a communication to the *Gazette* by Dr. William Campbell, and it is advisable to quote directly from it, as Simpson, apparently trusting to memory, is inaccurate in not a few of the figures he gives. Dr. Roberton begins thus:

> "Sir,
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> "The letter of Dr. Campbell on puerperal fever, which appeared in the *Medical Gazette* of December 10, has recalled my attention to certain facts in my possession, calculated to throw some light on the query which heads this communication.
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> "'On the question of infection' (Dr. Campbell observes) 'I am as much as ever impressed with the belief that unless the practitioner has been engaged in the dissection of the bodies of those who have fallen victims, the disease cannot be conveyed by him from females labouring under it to others recently delivered; but if he have been so engaged, I have strong reasons for believing that he may be the means of propagating it.' My experience," Roberton comments, "is not in unison with this conclusion. On the 4th of January last [1831] a meeting of the medical officers of the Manchester Lying-in Charity was summoned in consequence of a great mortality having occurred, during the four preceding weeks, among the patients of one of the midwives. The circumstances we found to be these: Mrs. A. B., a midwife in great practice among the patients of the Charity, had on the 4th of the preceding month delivered a poor woman, who soon died with symptoms of puerperal fever. From this date to the 4th of January inclusive—exactly one month—this midwife delivered thirty women residing in different parts of an extensive suburb, of which number sixteen caught the disease, and all of them ultimately died. These were the only cases of puerperal fever which had for a considerable time occurred in Manchester. The midwives, commonly twenty-five in number, deliver, on an average, ninety women per week. Now of this number delivered during the month in question, none had puerperal fever except the patients of Mrs. A. B. Yet all this time this woman was crossing the other midwives in every direction, scores of the patients of the Charity being delivered by them in the very same quarters where her cases of fever were happening. . . .
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> "The decision of the medical officers of the Charity was to the effect that Mrs. A. B. should abandon her practice for a short period, and go into the country."

Dr. Roberton concludes:

> "The fact that sixteen cases of puerperal fever occurred in one month in the practice of a single midwife, while the patients of the other midwives were exempted from the disease, leads naturally to the conclusion that this midwife was the *medium* of communicating (I take not upon myself to say *in what manner*) the malady from one woman to another—from one affected with the fever to another in health."

* The Lloyd Roberts Memorial Lecture, delivered at St. Mary's Maternity Hospital, Manchester, on November 10, 1937.

The modern conception of a carrier had not of course been considered in those days. Within the last few years I myself have taken a small part in the investigation of two similar epidemics in the practices of one only of each of two groups of midwives—both of whom had clean records for several years. In each epidemic it was clear that some of the patients were infected during the puerperium and not at the labour. In each instance haemolytic streptococci were found in the throats of the midwife, and both were cured by removal of the diseased tonsils.

Simpson came to the conclusion that the unfortunate midwife in question must have been, unlike the other midwives, "connected with some form of that morbific principle or virus to which pathologists give the name contagion." No one at that time had any conception of the nature of that virus. Some even held it could never be known. Charles Meigs of Philadelphia, a bitter opponent of Oliver Wendell Holmes's views, wrote in his *Treatise on Obstetrics*, 1856:

> "The student will naturally be desirous to learn, if childbed fever be really a contagious disease, what the principle of that contagion is; and I apprehend that here he shall have to rest content with the *sound* of the word contagion, a word which, being interpreted, means communicable from person to person, or by individual to individual. This is the whole meaning of the word; for, as to how, and the what, no man hath yet obtained the least definite notion, since no man hath known or can know what a miasm or a contagion is. Miasm and contagion are words, nothing more: they represent no precise material idea of the mind."

Dr. Roberton's account of the Manchester epidemic had been previously cited by Oliver Wendell Holmes (1843).

The High-pressure Sterilizer

It is also of great interest to record that John Roberton played a small part in an investigation which led to the invention of the high-pressure sterilizer, so essential to modern aseptic technique. Dr. William Henry, the famous physicist (1775–1836), also of Manchester, was making experiments on sterilization by heat, at the request of a cotton importer, in the hope of preventing the introduction of plague in cargoes of Egyptian cotton landed at Manchester. Dr. Henry (1831) states that "the most important point to be ascertained, and that on which the utility of the inquiry hinges, is whether temperature below 212° Fahrenheit is capable of destroying the contagion of *fomites*." To test the effect of different temperatures, for varying periods of time, Henry made use of fresh vaccine lymph. Among others, Dr. John Roberton, "one of the surgeons of the Manchester Lying-In Hospital," supplied Dr. Henry with the vaccine lymph. The double-jacket steam sterilizer was devised as the direct result of these experiments.

Thus this powerful means of destroying the cause of contagion was invented and in use thirty years and more before it was proved that the actual fomites were the micro-organisms of Anthony van Leeuwenhoek, microscopic protozoa which he had discovered—in water in 1675, and, in 1681, in material from the human mouth. It was ignorance as to the nature of these fomites—of the "precise material" of Charles Meigs, of the body or substance which could be conveyed by a third person from one patient to another—that had long delayed the wide acceptance of the theory of contagion. The final acceptance had been actually based on circumstantial evidence alone.

Years were to elapse before the elusive and, as it proved to be, microscopic malefic object was discovered, although, one is amazed to find, the transcendent brai of William Harvey had in 1651 used the term "fomes and had conceived the idea of "seeds of epidemic an contagious diseases" which "propagated to a distanc through the air," and "in a hidden fashion silently mult plying themselves by a kind of generation . . . sprea destruction far and wide among man and beast."

Skoda of Vienna, inspired by the theory of Semmelwe that poisonous animal matter was introduced by the han of the accoucheur into the genital tract, suggested t Semmelweis in 1849 that the problem should be investi gated by experiments on animals. By means of a brus at first, later a syringe, exudate from a case of endo metritis, or pus from an abscess, was introduced into th vagina and uterus of rabbits recently delivered. Late the post-mortem appearances were studied, but in th absence of microscopical examination nothing of rea value was learnt.

The Indictment of Bacteria

It was Louis Pasteur who initiated the investigation which were to lead to the indictment of bacteria o microbes as the long-desired *materia peccans* of con tagion. The study of diseases of grapes, of silkworms of cattle, had fired his imagination to "arrive at the knowledge of the causes of putrid and contagious dis eases" in human beings. After investigating septic case in the surgical wards of hospitals he studied cases o puerperal infection in the Maternité, finding in certain of them "a microbe in the shape of chain or chaplet which lent itself very well to culture."

The description by Monsieur Roux of an occasion (March 11, 1879) on which Pasteur proclaimed this dis covery is well worth recalling to our minds. "One day in a discussion on puerperal fever at the Academy, one of his most weighty opponents was eloquently enlarging upon the causes of epidemics in lying-in hospitals: Pasteur interrupted him: 'None of those things cause the epidemic; it is the nursing and medical staff who carry the microbe from an infected woman to a healthy one.' And as the orator replied that he feared that microbe would never be found, Pasteur went to the blackboard and drew a diagram of the chain-like organism, saying, 'There, that is what it is like!'"

He had found streptococci in the lochia of dying patients and had cultivated them from the blood, taken both before and after death. This was a discovery which must have undermined the opposition of any remaining anti-contagionists, and one can appreciate the satisfaction with which Oliver Wendell Holmes, writing to Dr. Chadwick in 1883 on the contagiousness of puerperal fever, is able to boast: "But I shrieked my warning louder and longer than any of them, and I am pleased to remember that I took my ground on the existing evidence, before the little army of microbes was marched up to support my position."

The new science of bacteriology thus arose, and was ardently pursued by a rapidly increasing army of investigators in all civilized countries. Other organisms were discovered, isolated, and proved to be the cause of rarer types of puerperal infection, most of which were much less severe and less frequently fatal than that caused by the streptococcus.

It is impossible, and really unnecessary for my purpose, to review the story of the discovery of these various organisms. This was admirably done by Arnold W. W. Lea (1910), also a member of the surgical staff of St. Mary's Hospital. The list he gives still stands: in

addition to streptococci it includes staphylococci, the colon bacillus, pneumococci, the gonococcus, the bacillus of diphtheria, of tetanus, of typhoid even, the *Bacillus aerogenes capsulatus* of Welch, and the *Bacillus pyocyaneus*.

The Introduction of Antiseptics

The discovery of bacteria was quickly followed by Lister's introduction, in 1867, of the chemical antiseptic with which microbes in septic wounds or on the skin of the patient or the hands of the surgeon could be rendered inert. Lister, employing the method with meticulous care, was soon able to revolutionize surgical operative practice. Certain obstetricians—and one must mention Hayes of the General Lying-in Hospital, London, and Tarnier of Paris—convinced of the identity of surgical and puerperal sepsis, introduced antiseptics into their midwifery practice, with a striking reduction in the occurrence of infection in the maternity hospitals they controlled. However, we must not forget that many years previously Robert Collins of the Rotunda (in 1829) and Semmelweis in Vienna (in 1847) had used a solution of chloride of lime to destroy the unknown virus of infection.

The use of antiseptics soon became the first line of defence in the campaign against puerperal sepsis, and so it remains to this day. Many forms have been introduced since the days of Lister's carbolic acid. The search for the ideal antiseptic has a story of its own, which some consider is not yet complete; many others are perfectly satisfied with the one of their choice.

Although the incidence of puerperal sepsis has been greatly diminished, the dread disease has by no means been eliminated. Sporadic cases are of not infrequent occurrence, and even epidemics occur in hospital as well as in private practice. Puerperal sepsis is still one of the chief causes of puerperal mortality. Some authorities maintain that this is only the consequence of the neglect or the inefficient use of the antiseptic ritual. Others, doubting this simple solution of a grave problem, have with infinite pains searched more and more deeply into the life-history of the microbes chiefly concerned, and particularly into their habitat—the lair in which they must be destroyed or between which and the woman in labour an effective barrier must be set up. Since Pasteur's day it has been recognized that streptococci cause the great majority of the serious and fatal infections. They have been intensively studied by devoted specialists, and gradually the complexity of the nefarious clan has been revealed. Streptococci are subdivided according to the way in which they grow: some are haemolytic, others have no action on blood, while others will only grow in the absence of oxygen. Of the haemolytic strains only one group (Group A) is capable of causing severe infection in human beings, and this group is further subdivided by intricate serological means into about twenty-five distinct types. Some half of these known types have been found to play a causative part in puerperal infections.

The history of these investigations is beyond my purpose and, indeed, my powers. I have chosen to attempt to unravel the story of the tracking of the villain to his chosen lair and the provision of a means to intercept him at its exit. I refer, of course, to the human throat and the surgical face mask.

The source of the problematical virus had for long been a matter of speculation, the most favoured being decomposing animal matter associated with necropsies and dissections, cancers, and surgical wounds, especially where midwifery cases and cases of general disease were housed under the same roof. Semmelweis and Holmes both laid down rules of conduct against these dangers. The means of conveyance were debated; clothes, the hands, the atmosphere were accused.

Charles Meigs, the anti-contagionist already quoted, ridiculed the idea: he tells of

> "another friend of mine who had been chased, so to speak, by a series of such cases, seventy in all, left the city, was absent many days, and on returning, shaved his head, got a new wig, new clothes, new gloves, new pencil. He went into a bath, was washed clean, dressed himself, and then visited and assisted a woman in labour who was seized next day and died." If the man "was poisonous," says Meigs, "how was he so? Everything except the man was new. He could not have carried the atmosphere of his last patient's chamber with him to the country, keep it about him like an invisible cloud," and "then carry it into the last patient's chamber to destroy her with exhalations more pestiferous than the breath of Cacus."

By the irony of fate Meigs's satirical flights of imagination had brought him near the truth: the "new pencil" wetted by the lips might have infected the doctor's fingers; the "exhalations more pestiferous than the breath of Cacus" may well have conveyed virulent streptococci. In fact this was so; for Meigs's friend was no other than the unfortunate Dr. Rutter of Philadelphia, who within five years had ninety-five cases of puerperal infection in his practice, with eighteen deaths. It is known that he suffered from ozaena due to chronic rhinitis.

Many years later, in 1924, two outbreaks of pyrexia at the Portsmouth Municipal Maternity Hospital were proved to be associated with the presence of a pupil midwife who suffered from atrophic rhinitis and in whose nose haemolytic streptococci were found.[1]

Relation of Streptococcal Sore Throats to Puerperal Fever

The discovery of microbes gradually led to the eclipse of mere conjectures; theories could henceforth be scientifically tested. The comment of Dr. John Clarke (1793)—that "it is a curious circumstance that before the attack of the epidemic of lying-in women at Paris in the year 1746, in the month of January, there had been an epidemic low fever, with an ulcerous sore throat"—has thus been illuminated by the discovery that certain members of Group A of the haemolytic streptococci can be much more readily found in human throats at the time of year when puerperal sepsis is most prevalent. Alexander Gordon, who wrote in 1795 on the "Epidemic Puerperal Fever of Aberdeen (1789–92)," prepared a set of tables showing the simultaneous prevalence of "inflammatory sore throat." Fleetwood Churchill (1849) speaks of the "epidemic season," between November and May, and shows that the eighteenth century writers on puerperal sepsis—Leake, Armstrong, Campbell, Hey, Joseph and John Clarke—all agreed that the "puerperal fever prevails most during the winter and spring months."

Although streptococcal sore throats are most prevalent from October to May, demanding specially careful precautionary measures in surgical and midwifery practice, they may occur at any season, and so the same precautions are actually always desirable. In my quest for the discoverer of this source of contagion I arrived at a paper by W. Hübener (1898) based on experimental work carried out at the Breslau Surgical Clinic of Professor Mikulicz. Hübener begins by referring to the pioneer work of

[1] *British Medical Journal*, 1924, **2**, 623.

Flügge, reported in 1895. Flügge had not only proved that the micro-organisms found in the human mouth might be pathogenic, but had demonstrated the "surprising and extraordinarily important fact" (to use Hübener's own words) "that when speaking, coughing, and sneezing a spreading about of the mouth and nose secretions takes place. Even at a distance of several metres he had shown that agar plates were covered with colonies after somewhat louder and livelier speaking." Flügge urged the exclusion from aseptic operations of all persons suffering from acute catarrh.

Mikulicz, searching for an "absolutely germless" surgical technique and at this time experimenting with sterilized thread gloves, was deeply concerned by this newly recognized source of infection. He immediately set to work to parry it. In July, 1897, he described the "Mundbinde" (mouth bandage) which he was using for this purpose. This is, I believe, the first publication on the subject. The material used was the finest mull, "sterilized of course," he says, and "fastened to the similarly sterilized operation-gown."

Although Mikulicz claimed that he had quickly become accustomed to their use and "could breathe through them as easily as a lady who in the street wears a veil," we find that he had asked Hübener to search, by experiment, for a comfortable as well as a secure means of protection. In his lengthy paper Hübener describes his method of experimentation. An assistant whose mouth had been thoroughly rinsed with a diluted culture of *B. prodigiosus* spoke and coughed, at varying distances and angles, over appropriately arranged agar plates. The green colour of the prodigiosus colonies made it easy to distinguish the germs "spoken out from the oral cavity" from those deposited from the air.

Evolution of the Face Mask

These experiments led to the gradual evolvement of a metal frame—a modified Esmarch chloroform mask—with spectacle ear-pieces, carrying a double layer of close-meshed mull. As evidence of the exhaustive character of these pioneer experiments it must be noted that Hübener demonstrated that the mask should be held at a distance of a few centimetres from the mouth, and this not for comfort only but to increase its efficiency as a filter. This is a requirement which is ignored in most types of mask, but it can be easily achieved by giving a snout-like projection, by means of a stiffened dart on each side of the simple oblong of folded gauze so much in use.

Concurrently with the investigations of Mikulicz and Hübener the problem was being studied in Paris. The famous surgeon Paul Berger read a paper "On the Use of a Mask in Operating" before the Surgical Society of Paris on February 22, 1899. He began with the statement: "For several years I have been worried as to the part that drops of liquid projected from the mouth of the operator or his assistants may exercise on the outbreaks of infection which one still sees from time to time under conditions of surgical asepsis which are apparently satisfactory." Berger's suspicions had been aroused by the association of a short series of cases of suppuration in clean operations with an assistant who was suffering from an alveolar abscess. The same mishaps occurred several months later, when he himself was suffering from a dental periostitis. His attention directed to the point led him to notice that drops of saliva were projected from the lips of the operator or his assistant even when isolated words, orders in monosyllables, were given. Aware of Flügge's discovery of the presence of pathogenic bacteria in the saliva, he had set to work to find a means of "shielding his operation wounds from this cause of contamination," even before Mikulicz had published his paper. In October, 1897, he began to wear a rectangular compress of six layers of gauze, sewn at its lower edge to his sterilized linen apron (he had a beard to safeguard) and the upper border held against the root of the nose by strings tied behind the neck. His investigations appear to have been purely clinical, but in the course of fifteen months he convinced himself that he had markedly diminished the incidence of sepsis after clean operations. His paper ends thus:

"It is exactly because I realize that perfection in the carrying out of operations aseptically must not concern itself with any one point but with all, and must neglect no detail, that I have been so anxious to insist on a precaution, the use of which has contributed not a little to improve my operative results. I do not blind myself to the fact that this is too great a shock to custom for it to receive a much more favourable welcome than that accorded by the German surgeons to an analogous communication by Professor Mikulicz."

His surmise was correct: in the discussion that followed a Monsieur Terrier scoffed at the proposal, saying, "I have never worn a mask, and quite certainly I never shall do so." However, in time surgeons did adopt the precaution, and probably the first English surgeon to insist, in a textbook, on the use of the face mask was that master of operative technique Berkeley Moynihan in his *Abdominal Surgery* (second edition, 1906). He pours ridicule on the scoffers "who claim to be satisfied with their results."

Berkeley and Bonney in their *Textbook of Gynaecological Surgery*, first issued in 1911, after testing by experiment the validity of the danger, stated their conviction that the surgeon and his staff should wear masks. Yet in their work *Obstetrical Emergencies*, even in the third edition of 1921, they do not mention the possibility of droplet infection. This illogical position was indeed shared by all, or nearly all, of us who have during the last twenty years practised both gynaecology and midwifery.

The Pioneer in the Use of the Mask

In seeking the pioneer in the use of the mask in obstetric practice I have come to the conclusion that Professor Benjamin DeLee (known at the moment to the American lay press as "Number One Obstetrician, U.S.A.") is entitled to the credit for this.

Let me tell the story in DeLee's own words, from a recent letter:

"I cannot say just when I first started to use face masks in obstetric practice. I believe it was certainly at the same time, or even before, the surgeons used them.

"Just about the turn of the century we had a small epidemic of puerperal infection among the mothers and the babies at the Chicago Lying-in Hospital Dispensary, the home service, which of course was astonishing.

"On investigation I found that one of the interns, who liked to teach and demonstrate to the students while he was delivering the women, had a slight salivation and little tiny droplets of saliva were present frequently at the corners of his mouth. All of the cases that got sick were handled by this particular intern, and one mother and one baby died of streptococcus infection.

"I made a careful study of this intern's nose and throat and found a short-chain streptococcus. I relieved him from service and gave him a position in the laboratory of a South

Side hospital. The epidemic ceased abruptly and we have had no trouble in this regard since.

"I immediately instituted rules and regulations regarding talking on obstetric cases (such as averting the face when talking over a patient so as not to spit upon her, keeping the hands away from the face and mouth while on duty so as not to infect them with saliva, not to attend a labour case if suffering from a head cold or sore throat, etc.), but I do not remember that I insisted on masks.

"The first record that I have of the use of masks is in 1907 while I was preparing the third edition of my book on obstetrics for nurses, which was published in 1908. There is a picture in this book of the doctor aiding the parturient to bear down, and he wears a face mask."

The first protection used by DeLee was "a thick scarf of cheese-cloth." Finding that spittle could be driven through the mesh of this he used thick towelling, and this again he fortified with a four-inch square of adhesive plaster during epidemics of colds or if he himself had a sore throat and had to continue at work.

Kanter and Pilot (1924) appear to have published the first account of a bacteriological investigation of the likelihood of droplet infection in obstetrical practice. It was carried out in the extern department of the Presbyterian Hospital, Chicago. They found "no evidence to support auto-infection from vaginal streptococci," but concluded that "droplet infection from attendants is possible and that the use of masks during delivery and the exclusion of those having sore throats from the delivery room and from attendance on puerperal women is clearly indicated."

Delay in the Use of the Mask

Apart from its use in Caesarean section there has been an astonishing delay in the employment of the face mask in hospital and, even more so, in domiciliary midwifery practice. It is sad to reflect that its adoption or more rigid use in this or that institution, on this or that maternity district, has so often been and still is the direct consequence of an epidemic, more or less rapidly controlled, in the hospital itself. It would appear that some even await the stimulus of legal proceedings.

Investigation into Hospital Epidemics

Many such epidemics have been laboriously investigated by bacteriologists especially skilled in the recognition of the various types of streptococci. It is only in this way that the origin or the originator of the epidemic or of the sporadic case can be detected and indicted with a degree of probability almost amounting to certainty. The first of these thoroughly investigated epidemics was that which occurred in the Sloane Hospital, New York, in January and February of 1927. Of 163 delivered women twenty-four (15 per cent.) developed haemolytic streptococcal infections; eight of these died. It was fully reported in the August number, 1928, of the *American Journal of Obstetrics and Gynaecology* by Professor B. P. Watson and Dr. Frank Meleney. A complete bacteriological examination of the hospital failed to demonstrate haemolytic streptococci in the air, on the floor or walls, in the operating room, in dressings, supplies, or water. The only place where streptococci were found, other than in the infected patients, was in the nose and throat of certain doctors, nurses, and members of the domestic staff. In the summary of these papers it was laid down that it is "important to exclude streptococcal carriers from maternity hospitals and to insist on complete masking by all in attendance on parturient and puerperal women." Thus one result of this epidemic was the much more rigid masking of both mouth and nose.

The Sloane Hospital Report aroused widespread interest in a source of infection which, as we have already seen, had been suspected by a few for years but had never before been strongly attested. The report was reviewed and warmly welcomed by Professor DeLee in the section of obstetrics of "The Practical Medicine Series" for 1928. At last he had powerful scientific support for the complete masking of mouth and nose, which he had already been employing and advocating in midwifery practice—against much opposition—for no less than twenty years.

In June, 1929, Nixon and Wright reported two fatal cases of pneumococcal septicaemia during the puerperium from University College Hospital, London. The second patient was a hospital "district nurse." By serological tests it was found that the throat of one of her attendants (who was suffering from a severe "cold") yielded pneumococci of the same type—Type I—as the vagina, uterus, and blood of the woman. This is, I believe, the first case recorded in which the bacteriological evidence attained such a degree of probability. As a consequence face-masks, which had been used at deliveries within the hospital since early in 1927, were made compulsory on the district.

Just one more instance of a compelled change of policy. In the early months of 1936 one of the most famous maternity hospitals in the world, the Rotunda (see Annual Report), experienced an epidemic of streptococcal sepsis; four out of fourteen cases ended fatally. This coincided with a severe outbreak of streptococcal throats among the hospital staff and in the city. A full investigation was made, and among the conclusions we read: "Up to this time masks had not been used *in the maternity department*, but this epidemic and the knowledge of the mode of origin decided a change of policy."

Other Investigations

Many similar investigations have been made since 1928 It is impossible to enumerate or analyse them. However, I believe that all authorities would wish to give a special recognition to the work of Dr. Leonard Colebrook. In a chat with Professor DeLee in Chicago last autumn I was asked to convey the Professor's personal gratitude to "the Colebrooks" for their work on the sources of infection in puerperal sepsis. Dr. Leonard Colebrook has summarized this work; referred freely to that of others; and given his own conclusions in *The Prevention of Puerperal Sepsis*, published in 1936. This should be carefully studied by everybody—midwife, accoucheur, and administrator—concerned for the safety of childbirth.

In 1925 puerperal sepsis was the chief subject for discussion at the British Congress of Obstetrics and Gynaecology, held in London. The possibility of droplet infection was not even mentioned. Professor Whitridge Williams, who took part in the discussion, was impressed by the fact that in a series of streptococcal infections in his service 30 per cent. of the patients had had spontaneous labours without even a vaginal examination: this is a generally accepted proportion. He thought that all bacteriological evidence pointed to the rarity of endogenous auto-infection—all recent work has supported this view. After stating that there must be "some form of external infection which escaped recognition" he drew attention to the possibility of parturient women conveying the organisms on their fingers to the vulva or vagina. This is a danger well recognized by the supporters of

the theory of droplet infection, and special precautions are laid down to thwart it: precautionary advice; a mask for the woman known to have an infected throat; careful and repeated cleansing of their hands; and, in my own practice, a double clove-hitch on the wrists to prevent the hands of the woman in twilight sleep from wandering to the vulva.

As the experts at this congress were oblivious to the droplet danger it is not surprising that the current textbooks on midwifery contained no reference to it. And yet it would seem that, thinking logically, there is the same necessity for rigid aseptic technique in obstetric as in surgical practice. In the seventh edition (1912) of Hirst's *Obstetrics* the mask is considered necessary in major but not in minor surgery, and not in making obstetrical examinations and manipulations. This fallacious view has been held to a ridiculous extent. I have recently seen a gynaecologist wear a mask in an operating theatre whilst repairing a perineal tear of thirty years' duration, but disdain its use when suturing, in a labour room, a tear sustained ten minutes previously. Thus most of us acted less than ten years ago.

The English textbooks on midwifery were late in drawing attention to the danger. One of the best-known did not refer to it in 1925 in its sixth edition. In the seventh edition of 1931, however, we read that the human throat is the chief habitat of the haemolytic streptococcus, and that masks completely covering mouth and nose should be worn by all who are in attendance on labour and by nurses during the puerperium.

It will be asked: Is there evidence of benefit from the rigid use of these, together with other rational precautions, such as early detection and exclusion with appropriate treatment of attendants who have infected air passages and the immediate investigation and segregation of lying-in women at the onset of pyrexia? It is obvious that the masks must be efficient and that they should be in position before the hands are sterilized and before instruments and other appliances are removed from the sterilizer and laid out ready for use—preferably, indeed, before the labour room is entered.

I believe there is convincing evidence from several maternity hospitals where for the last five years or more there has been thorough bacteriological control of the work of the hospital—both indoor and outdoor. Comparison of the results in these two departments has yielded unexpected figures of great significance.

Dr. Joan Rose of the Elsie Inglis Hospital, Edinburgh, in a second report (1936) on "Bacteriological Control," says: "Observations on the incidence of haemolytic streptococci in lying-in women have been continued over a period of six years. The figures for the past three years show that while the general morbidity in hospital and on districts remains low, the pyrexial rate associated with these organisms *is higher on the district than in the hospital*."

Dr. R. G. Douglas (1937) states that all these precautions—and he lays great stress on efficient masking—have been rigidly employed at the New York Lying-in Hospital since September, 1932. He shows that the incidence of streptococcal pyrexia was two and a half times as frequent in the home as compared with the hospital deliveries. The same result has been obtained in comparable conditions in the practice of the Jessop Hospital, Sheffield, under the control of two whole-time bacteriologists.

The Report of the Obstetric Registrar of University College Hospital, London, for 1936 records that whilst two cases of haemolytic streptococcal infection occurr in 348 district deliveries there were no cases among t 1,034 deliveries in the hospital itself.

Dr. Leonard Colebrook reports that during the last fi years the risk of developing a haemolytic streptococc infection has been 30 to 40 per cent. higher for an booked case delivered in her own home than it is fo similar booked cases delivered in Queen Charlotte's Ho pital, and this in spite of the hospital having to deal wi many already infected emergency cases. He continues: " am sure that whereas the risk of sepsis in well-conducte maternity hospitals is growing less and less, we shall nev have adequate control over the manifold dangers of famili infection in the overcrowded houses of the poor. I a glad, therefore," he adds, "to see the tendency for mo hospital deliveries, and I think we should encourage an facilitate that movement."

Air-borne Infection in Dust

These results have led Colebrook and others to revi investigations into the possible danger of air-borne infe tion in dust. That the atmosphere was the chief vehic of contagion was believed by many a hundred years an more ago. The belief was substantiated when Paste showed that the air was populated with microbes whic caused putrefaction and fermentation. John Tyndall, th physicist, devised beautiful experiments and apparatus t demonstrate the presence of germ-laden dust in the atm sphere, and thus upset the theory of spontaneous gener tion. Lister attempted to counter the danger by the us of the carbolic spray, within the range of which surgic operations and even childbirth were conducted. Furthe bacteriological investigations drew attention away fro this to other more frequent sources of infection. But is our duty to leave no possible source of danger unheede

The most recent work on air-borne infection has bee carried out by William and Mildred Wells (1936) Harvard University. The experiments are ingenious and th results impressive. In an air-conditioned room with an a centrifuge respiring at the human rate "sneeze-powder" was projected at will among a group of graduate Bacterial samples of the air were collected by the centr fuge into blood-agar tubes. These workers demonstrat that "it would seem obvious that under conditions crowding in enclosed rooms we are breathing one another nasopharyngeal flora, as we once drank each other intestinal flora in our water supplies." In searching fo means to effect air sterilization they have found that germ are killed by ultra-violet rays. Floodlights emitting thes rays are now in use in a corridor of the Children's Ho pital, Cambridge, Massachusetts, and in the number o the *Journal of Thoracic Surgery* for October, 1936, there is a picture of an operation being conducted within th range of a battery of these lamps.

Charles White, the founder of St. Mary's Maternit Hospital, keenly alive to the dangers of "the foul an disagreeable air" of many hospital wards, strongl advocated ventilators and "every other assistance fo clearing the wards of foul air." He would no doubt b delighted with the modern American air-condition hospital ward.

Conclusion

I fully realize that I should be doing a great disservic to a cause which I have much at heart if I left th impression that it is only against streptococcal infection and in particular against the droplet danger, that advocate precautionary measures. It is largely a matte

of time that has led me to confine myself to this one danger.

The history of the discovery of infections by other organisms—staphylococci, the gonococcus, pneumococci, the *Bacillus coli*, the bacillus of Welch, etc.—and the special precautions required to anticipate and thwart each one of them, are of great interest and importance. It would be folly to neglect them while concentrating on one special danger. The most complete surgical technique is essential in really safe midwifery practice. New knowledge may lead to its modification, and it may be that a future Lloyd Roberts lecturer will find this paper of mine useful in composing his own on "The Rise and Fall of the Obstetrical Face Mask."

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A report by the Food Council to the President of the Board of Trade on its inquiry into the costs and profits of retail milk distribution in Great Britain has now been published by H.M. Stationery Office, price 9d. The main objects of the inquiry were to examine the extent and the causes of the differences between the financial results, per gallon of milk sold, of various businesses; to ascertain whether retail milk distributors are, on the whole, making an unduly high rate of net profit or rendering unnecessarily expensive services; and to consider the possibility of eliminating any such services and achieving generally a more economical retail distribution of milk. In its conclusions the Council suggests possible lines of action by which a reduction might be made in the average margin covering the expenses and profit of the distributor, in order to achieve a reduction in the retail price of milk.

THE LYMPHOID TISSUE OF THE ALIMENTARY CANAL*

BY

H. GORDON THOMPSON, M.D., F.R.C.S.

(From the Division of Clinical Research, Henry Lester Institute, Shanghai)

(WITH SPECIAL PLATE)

The lymphoid tissue of the alimentary canal consists of the tonsillar and pharyngeal ring, the Peyer's patches, the vermiform appendix, and the solitary follicles of the large intestine, but in order to come to a proper understanding of these lymphoid foci a few words about the lymphatic system as a whole are necessary.

It is the accepted belief now that in vertebrates the lymphatics form a closed tube system and do *not* communicate with the tissue spaces, with the serous cavities such as the peritoneal and pleural cavities, or with the ventricles of the brain or the central canal of the spinal cord. The lymphatic capillaries form dense networks in most of the tissues of the body, these unite to form larger vessels, and the largest, the right and left thoracic ducts, empty their contents into veins and contribute various-sized lymphocytes to the blood stream. Moreover, as Drinker and Field (1933) point out, care must be taken to distinguish between true lymph obtained from lymph vessels; tissue fluid, the fluid in the region outside blood and lymph capillaries in the cellular interspaces; and plasma, the unclotted fluid of the blood, which differs markedly from lymph and tissue fluid in protein content and to a less degree in salt content. As Drinker and Field say, "the three fluids should not be confused with one another or with blood serum as is frequently done—particularly by immunologists uninoculated with a physiological conscience."

Moreover, as Maximow (1935) asserts:

"The lymphatic networks are distinguished from the blood capillaries by ending blindly in rounded or swollen ends. This is best seen in the mucous membrane of the small intestines, where a network of lymphatic capillaries or a single blindly ending vessel, the central lacteal, extends in the lamina propria up to the end of the villus. The lymphatic capillaries form expanded networks of considerable size round the solitary and aggregated lymphatic follicles of the intestine. They consist of a single layer of flat endothelial cells. The larger lymphatic vessels have valves and slightly thickened walls containing elastic fibres, smooth muscle, and interlacing collagenous fibres."

Maximow concludes his description of lymphatic capillaries and vessels with the important statement, "As the lymphatics form a closed endothelium-lined system of tubes the tissue juice must pass through the endothelial cytoplasm to reach the lumen of the lymphatics."

But the lymphatic system does not consist only of lymphatic vessels. These have associated with them collections of lymphoid tissue known as lymph nodes—sometimes called lymphatic glands—and also lymphoid follicles, the latter being solitary or aggregated follicles according to whether they are single or gathered into groups.

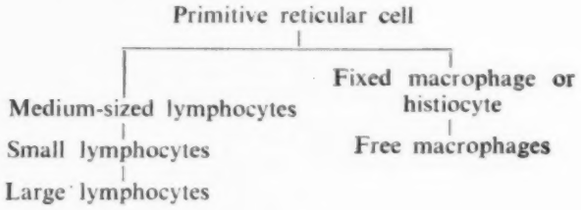
I do not propose to refer further to the lymph nodes, although their internal structure is very similar to the collections of lymphoid tissue elsewhere, but I wish to

* A lecture given at the Henry Lester Institute of Medical Research, Shanghai.

direct your attention to the follicular collections of lymphoid tissue to be found along the alimentary tract.

All lymphatic follicles are composed of a framework and free cells. The framework consists of reticular fibres and fixed cells, which may be flattened out, and correspond to the endothelial cells lining the ordinary lymphatic capillaries. In the lymphoid follicles they are sometimes called histiocytes, or fixed macrophages, because they may have phagocytic powers. As I have pointed out, the lymphatic capillaries form expanded networks round the solitary and aggregated lymphatic follicles of the alimentary tract, including the tonsils, but there is no evidence that these capillaries are continuous with the spaces in the lymphoid follicles in which the free cells are found. The free cells in the meshes of the framework consist of free macrophages and lymphocytes; the former are formed from the fixed macrophages and are highly phagocytic, while the latter are classified as small, medium, or large.

According to Maximow the primitive reticular cells give rise to the fixed and free macrophages, and also the medium-sized lymphocytes, which are the precursors of the large and small lymphocytes, the small lymphocyte being capable of development into the large, which then divides mitotically and produces small ones. Diagrammatically they may be represented thus:



The difference between the lymphoid follicles seen in the lymph nodes and those found in the lymphatic tissue of the alimentary tract is that the latter do not possess lymphatic sinuses and lymph is not filtered through them. They are provided, however, as mentioned before, with net-like plexuses of wide blindly ending lymph capillaries, which surround their outer surfaces except where the follicles come in close connexion with the epithelium of the alimentary tract.

The lymphoid follicles, both in the lymph nodes and in the lymphatic collections of the alimentary canal, consist of a superficial and a deep layer which tend to merge into one another. The superficial follicles comprise a compact mass of lymphocytes embedded in a cellular and fibrous reticulum, while the deeper layer has an outer dense mass of lymphocytes and a lighter-staining germinal centre. The latter is situated in the centre of the deeper follicle and passes through a series of cyclic changes, during which an intense new formation of lymphocytes is brought about through proliferation of pre-existing large lymphocytes and through transformation of the primitive reticular cells. The deeper follicles also include degenerating cells with a poor affinity for nuclear stains, which we have called debris cells because they appear to contain granular debris and crystals.

Another big difference between the lymphoid follicles in the alimentary canal and those in the lymph nodes appears to be this—that the stream of small lymphocytes which is the end-product of the lymphoid tissue of the alimentary canal flows in two directions, towards the lumen of the bowel (Special Plate, Figs. 1 and 2) and towards the subserous lymphatics (Fig. 3). The greater part enter the lumen of the gut, whereas in the case of the lymph nodes it is towards the lymph sinuses and efferent lymph vessels and so on to the thoracic duct and the blood stream; and, moreover, it is a characteristic of the epithelium overlying the lymphoid follicles in the alimentary canal, no matter whether it is squamous or columnar, that it is constantly found to be infiltrated with lymphocytes. In other words, there is a definite flow of lymphocytes from the deeper follicles or germinal centres through the superficial follicles, then through the epithelium into the lumen of the alimentary canal. These lymphocytes are amoeboid but not phagocytic. Some macrophages and large lymphocytes are also discharged into the intestine, but these are few in number, for the macrophages and the large and medium lymphocytes mostly remain in the centre of the deeper follicles, forming the germinal centre.

May I request your attention to the lymphoid tissue of the alimentary tract as a whole: first, its development; secondly, its position.

Development of Lymphoid Tissue

It is an interesting fact that the development of the lymphoid tissue of the alimentary canal is associated with early life. For example, the lymphoid tissue of the tonsils first appears in the last month of foetal life, generally reaches its maximal development in childhood, and begins to atrophy about the age of 15. Digby (1919) has pointed out that the lymphoid tissue in the appendix of the rabbit is almost entirely developed just after birth.

In order to confirm this we made a series of microscopical sections of the vermiform appendix of small rabbits from the same litter at different times after birth (immediately after birth and seven days, fourteen days, and thirty days after), and the rapid development of the lymphoid tissue was clearly seen. Now the contents of the alimentary canal before birth are sterile; but soon after birth they become infected, and, as Digby says, "it would almost seem that it required the stimulus of bacteria in the alimentary canal to provoke the development of the lymphoid tissue."

I have pointed out on a previous occasion that in the lymphoid tissue of the rabbit's appendix there are normally found numbers of Gram-positive bacteria, and it seemed to be of interest to know how early in life these were present. In the section made just after birth and in seven-day specimens no organisms were seen. In the fourteen-day sections organisms were found on the epithelial surface, but none in the lymphoid tissue; but in the thirty-day sections they appeared both in the crypts and—although not numerous they were definitely present—in the lymph follicles. It would thus seem that the development of the lymphoid tissue begins slightly earlier than the appearance of the organisms, but that the two are definitely associated.

Position of the Tissue

Lymphoid tissue of the alimentary tract occurs in the following positions:

1. At the back of the mouth and nose, where there is an almost complete ring of lymphoid tissue consisting of the lingual, palatine, and pharyngeal tonsils.

2. In the lower part of the small intestine, as Peyer's patches.

3. In the caecum, as the vermiform appendix.

4. In the large intestines, as solitary follicles.

Now in all these places there appears to be a special relation to bacterial infection.

The tonsillar lymphoid ring, as we may call it, is at the entrance to the pharynx, where the path of the food and the path of the inspired air cross one another; in other words, the point where the maximum possible combined air-borne and food infection may occur.

The Peyer's patches begin where the curbing antibacterial action of the gastric juice and the bile begins to lose its power and micro-organisms begin to multiply. The Peyer's patches become more marked in the lower part of the ileum, until in some animals, such as the pig, there is to be found an enormous Peyer's patch about six feet long in the lower portion of the ileum next to the ileo-caecal valve.

The vermiform appendix with its lymphoid tissue is situated at the apex of the caecum at the point where there is probably the greatest stagnation of broken-down food-stuffs and where bacteria are most able to multiply. It is a fact that over 50 per cent. of the contents of the caecum of the rabbit is composed of bacteria.

The solitary follicles of the large intestine, again, are in the place where there is marked fermentation and bacterial action.

Thus we see that in all of these places there is apparently a special relation to bacterial infection. Of course it may be a coincidence, but it is certainly very suggestive.

The Lymphoid Ring of the Throat and Nose

Now let us consider the lymphoid ring at the back of the throat and nose. Here the bacteria are taken in by respiration and food. They are for the most part swallowed and are then destroyed by the acid gastric juice, but before entering the oesophagus they have incorporated with them the salivary corpuscles, which are the lymphocytes discharged by the lymph follicles of the tonsils. Digby suggested that the tonsils and adenoids by inviting a direct local infection possibly protected the body as a whole by conferring a general immunity, and it is true that pathogenic bacteria have been found in the lymphoid tissue of the tonsils and have been traced from this point of entry to the lymph nodes of the neck. But although I am not an immunologist I would suggest that possibly the tonsils act also in a somewhat different way, that the discharged lymphocytes or salivary corpuscles react to the bacterial toxins and supply a dose of immune bodies which are swallowed and absorbed by the alimentary canal and help to establish immunity in this manner. Associated with the tonsillar lymphoid tissue are small glands with ducts opening between the folds. During the act of deglutition the ring of lymphoid tissue is contracted, there is a discharge of mucus from the glands, while the lymphoid tissue contributes numerous lymphocytes to the food mass.

A few years ago it was the fashion for children to have their tonsils removed on the slightest pretext, and I remember that when I was a house-surgeon tonsillectomy for enlarged tonsils, not necessarily septic, was by far the most common operation in a large general hospital; but it is now coming to be realized that healthy tonsils must have some use, and that simple enlargement, so long as it is not causing obstruction to respiration, is due to the response of the body to some lack of hygiene or to some dietetic deficiency. It is now a fact that simple enlargement of the tonsils is fast disappearing in European countries, and therefore careful distinction must be made between slight tonsillar enlargements and septic tonsils which cause much ill-health. Layton (1936), surgeon in charge of the throat and ear department of Guy's Hospital, writing in the *Lancet* in May of this year and speaking from clinical experience, says that in children under 5 to 8 years of age removal of the tonsils impairs resistance to infection—not to the specific diseases such as diphtheria or measles, but to that of general infections, leading to sore throat and colds, and the appearance of diffuse shotty glands in the neck. He further points out that later on, at 14 to 16 years of age, catarrhal deafness is distinctly more common in children who have been subjected to what he calls "flaying of the pharynx," where tonsils and adenoids are completely removed. Moreover, he points out that in the children of the poor living in less hygienic conditions the results may be very serious, and vary from a fading away of the child for no apparent reason to a chronic nasal catarrh which makes it seem as if the child is never free from a cold. He also adds that it is extremely difficult to cure an otitis media which occurs in a tonsillectomized child. All of these facts support the theory that the lymphoid tissue of the tonsillar ring is associated with the protection of the young subject from bacterial infections and that it is of value in the economy of the growing child.

Lymphoid Tissue of the Small Intestine

Turning next to the collections of lymphoid tissue in the small intestine, we must remember that these are associated with the alimentary canal on the one side and with subserous lymphatic vessels on the other. It has been argued that not only the lacteals but also the lymph follicles are associated with the absorption of fat, and that in the latter case this was largely the work of the lymphocytes; but Yoffey (1932) has reported, as the result of experimental work on dogs after feeding the animals on half a pound of lard and collecting the lymph over a period of eight hours from the thoracic duct, that although this was perfectly white and appeared to contain a large quantity of fat, in no case was the proportion of fat higher than 3 per cent., so this would account altogether for only 6 grammes absorbed via the lymph out of a total fat absorption of 226 grammes. Furthermore, even this small amount of fat was not absorbed by the lymphocytes, which in the thoracic duct are practically all (98 per cent.) small, with only the faintest suggestion of a cytoplasmic ring—and no fat could be demonstrated in the lymphocytes by histochemical methods.

I think we can therefore rule out the suggestion that the lymphoid follicles, either solitary or aggregated in Peyer's patches or the vermiform appendix, have any real function in connexion with the absorption of fats.

Relation to Bacteria

Passing on to the relation of the intestinal lymphoid tissue to bacteria, we find strong evidence of this. We have seen that there is a constant and steady discharge of lymphocytes in two directions: (1) into the alimentary canal, and (2) into the subserous lymphatics and so to the thoracic duct. It has not been possible to estimate the number of lymphocytes discharged into the bowel, but the number of those which pass into the blood stream from the lymphatic system as a whole through the thoracic duct is enormous.

Yoffey (1932) found that in a 10-kilogramme dog, on an average, 25 c.cm. of lymph could be collected hourly from the thoracic duct. This had a lymphocyte count of 10,000 to 11,000 per c.mm. The longest period over which lymph was collected was eight hours—this would give a daily lymphocyte output of 6,600,000,000. But the total lympho-

cytes in the circulation in this-sized animal averaged out at 2,000,000,000. It therefore appears, as he pointed out, that all the lymphocytes of the blood are replaced three times daily. He suggests that it is quite likely that the lymphocytes are concerned with the active growth processes of childhood, and that the lymphoid tissues act as a storehouse of primitive wandering mesenchymal cells to supply the various tissues as they are needed. He states his belief that the fundamental problem of lymphoid tissue is concerned more than anything else with the fate of the lymphocyte. What, then, is the fate of the lymphocytes manufactured in the lymphatic follicles of the alimentary canal?

In our own work one of the principal objectives was to discover whether we could confirm a definite migration of lymphocytes into the lumen of the alimentary canal. Accordingly a number of rabbits were operated upon, the vermiform appendix was separated from the apex of the caecum, which was closed with a purse-string suture, and the open base of the appendix was brought to the surface so that its secretion, if any, could be examined. In a previous lecture I reported that we had constantly found the ferment amylase present in the secretion of the appendix, so I will not refer to this again; but the point which I wish to emphasize is the fact that the secretion contained great numbers of lymphocytes, a few large macrophages, and some eosinophil cells. Thus there appears to be no doubt that there is a regular flow of cells from the lymphoid tissue into the lumen of the alimentary canal, and that these cells are almost entirely small lymphocytes. There was no evidence that the lymphocytes were acting as phagocytes, although numerous bacteria were present.

The Reaction to Pathogenic Bacteria

Our next effort was an endeavour to discover what was the reaction of the lymphoid tissue to pathogenic bacteria. For this purpose cultures of two kinds of bacteria were prepared for me by the Division of Pathological Sciences: first, bovine tubercle bacilli; and, secondly, *Staphylococcus aureus*. These organisms were chosen because we needed something which would be readily distinguished from the ordinary flora of the alimentary tract.

In a series of nine rabbits the appendix was obstructed and after a few days' interval the abdomen was reopened; part of the fluid secreted by the appendix was aspirated off and replaced by 1 c.cm. of the culture of tubercle bacilli. After a further interval, varying from five minutes to several days, the appendix was removed and examined, smears were taken, and sections cut of the appendiceal wall. It was found that the tubercle bacilli rapidly disappeared from the contents of the appendix. In one case acid-fast debris was discovered in the deeper lymphoid follicles; and, in another, acid-fast droplets were present on the surface of the epithelium, suggesting that bacteriolysis had taken place. In a third, acid-fast droplets were found both in and just beneath the epithelium of the mucous membrane. In a fourth case, where the animal was allowed to recover, death took place three months later from generalized tuberculosis. I realize that the number of animals used was too small for any definite statement to be made, but the results are suggestive, first, that bacteriolysis takes place either in the lumen of the bowel or in the lymphoid tissue, and, secondly, that bacteria may pass rapidly through the lymph follicles: they may be phagocytosed by the macrophages, or if the infection is a heavy one may pass on into the subserous lymphatics and thus into the general circulation, giving rise to a generalized infection.

Turning to the injection of staphylococci, a culture of *Staphylococcus aureus* was prepared for me by Dr. Tar... The organisms were killed, and then injected into the lumen of the vermiform appendix, the sacculus rotundus of the caecum, and the small intestine opposite to a Peyer's patch, after these had been closed off from the rest of the alimentary canal. Six rabbits were used, and at intervals of from one and a half to fifteen minutes the appendix, sacculus rotundus, and Peyer's patch were removed for histological examination. In the case of the appendix, sections showed some of the organisms on the surface of the epithelium or passing down the crypts, some just beneath, between or associated with lymphocytes within the epithelial cells, some in the superficial and deep lymph follicles, and a few in the lymph spaces.

We had previously noticed that where bacteria were particularly thick upon the surface of the epithelium there appeared to be a moving out of the lymphocytes through or between the epithelial cells as if to resist, and yet there was in that locality no active phagocytosis, thus confirming the theory that any lymphocytic action must be by bacteriolysis, with the formation and discharge of granules (Fig. 4).

At the same time some bacteria could pass through or between the epithelial cells, enter the lymph follicles, and migrate to the deeper parts, where they are met by the macrophages, a second line of defence being formed by phagocytes. The sacculus rotundus and the Peyer's patch showed similar results, but not nearly so marked as in the case of the appendix.

We have previously noted that in the rabbit the lymphoid tissue of the alimentary canal is normally associated with the presence of Gram-positive bacteria, and our next effort was to try to find where these bacteria came from and whether there were any conditions which affected the amount of lymphoid tissue or the number of organisms present, and so lead to some theories as to the function of the lymphoid tissue or the reason for the presence of the bacteria.

Effect of Vitamin A Deficiency

Accordingly several batches of rabbits were put on to a vitamin A deficient diet. It was obvious that the numbers of organisms in the lymphoid tissue were markedly increased; and not only were they present in large numbers scattered throughout the deeper follicles, but they appeared to be massed in colonies as if they were multiplying locally. Especially was this the case in the lymphoid tissue of the vermiform appendix; it was so to a less degree in the sacculus rotundus, and to a still less degree in the lymphoid tissue of the Peyer's patch, situated a few inches from the ileo-caecal valve.

It was also noted that when the animals had been deprived of vitamin A their lymphoid follicles showed signs of atrophy, and in the later stages, when they had begun to develop signs of xerophthalmia, the lymphoid follicles were represented by only a very thin layer of leucocytes (Fig. 5). This was so marked that it was decided to see whether the readministration of vitamin A would cause a regeneration of the lymphoid follicles. A rabbit was therefore chosen which had been on a vitamin A deficient diet for several months and in which xerophthalmia was well developed. The animal was given a similar diet with the addition of carotene in oil for one week and then killed, and the appendix and other lymphoid organs removed. When the lymphoid tissue was examined it was found that the deeper follicles showed the characteristics of active regeneration, with both superficial

and deep follicles present. (Fig. 6). This work requires confirmation, but if this is forthcoming it is certainly suggestive as a possible reason for the decline in the protective mechanism of the organism against infection and also for the loss of immunity against bacterial infection in vitamin A deficiency.

Professor McCoy lectured recently upon "Immunity in Helminth Infections," and he stated that an immunity is developed in some way at present unknown while the worms are in the alimentary canal. He demonstrated that the development of this immunity could not be brought about after animals had been for two weeks on a vitamin A deficient diet and before there was time for the development of epithelial changes. May it not well be due to the effect of a lack of vitamin A upon the lymphoid tissue of the alimentary tract?

Commentary

You may ask why a surgeon should venture into the sacred domain of bacteriology and dietetics; the answer is that I believe that just as you have a recognized department of medicine known as "preventive medicine," so there ought to be an endeavour to establish "preventive surgery." I visualize the time when the physician will try to prevent and even treat his typhoid cases, which after all are probably simply attacks on the lymphoid tissue of the Peyer's patches by *B. typhosus*, and the surgeon will try to prevent an attack of appendicitis, which is probably an attack of septic organisms on the lymphoid tissue of the vermiform appendix—possibly in both cases by a well-balanced diet or by vitamin therapy.

Anyhow, every advance in the science of medicine brings nearer the time when medical and surgical advice will be sought more for the prevention than for the cure of disease: for, as recently pointed out by Sir Robert McCarrison, Medicine is not simply concerned with the cure but still more with the prevention of disease, and we surgeons are quite willing and anxious to do our share in the discovery of means whereby we can beat our scalpels and forceps into forks, spoons, and chopsticks for the administration of a well-balanced diet.

I want to thank Drs. H. C. Hou, F. F. Tang, and Yu-ho for much helpful advice, Mr. Henderson for his painstaking efforts in assisting me in this piece of work, and Mr. R. V. Dent for the photomicrography.

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H. v. Heuss (*Med. Welt*, November 6, 1937) describes the effects of the "yellow-cross" poison gas, dichlordiethyl sulphide. It is lipoid-soluble and it impregnates the superficial layers of the skin, reaches the subpapillary blood vessels and their nervous plexuses, and since these plexuses are rich in lipoids it tends to accumulate there. The general clinical picture is somewhat similar to that of Addison's disease. The affected individuals are apathetic and adynamic; they suffer from vomiting and diarrhoea and they lose weight, and some cases may show pigmentation of the skin. The author, therefore, recommends for these cases extracts of suprarenal cortex in combination with glucose administered intravenously or intramuscularly.

THE MODERN TREATMENT OF DIABETES MELLITUS AND THE USE OF ZINC PROTAMINE INSULIN*

BY

F. GRAHAM LESCHER, M.A., M.D., M.R.C.P.

Physician, Derbyshire Royal Infirmary

Until about fifteen years ago the treatment of diabetes mellitus in the young and middle-aged was generally unsatisfactory to the doctor, and often almost cruelty to the patient: carbohydrates, fats, and proteins were progressively restricted as the disease advanced, so that the unfortunate patient eventually existed in a state of semi-starvation, until coma and death released him from his sufferings, usually within two or three years from the time the diagnosis was first made. About the year 1922, however, with the introduction of insulin, the renaissance of the treatment of diabetes took place. Even then the policy was still to limit the patient's diet so that only a minimum dose of insulin was required: for it was then uncertain what the exact effect of insulin would be if given over a long period.

Modern Methods of Dieting

It has been only during the last few years that, as a result of the increasing knowledge of the effect of insulin, gradually more liberal carbohydrate diets have been allowed, and lately, unless the patient be overweight, 150 to 200 grammes or more of carbohydrate per day have been given, with a somewhat restricted amount of fat. It has not been found that the insulin has to be increased to any great extent on this account. I have a patient, a young woman, suffering from a severe toxic goitre with much wasting, together with true diabetes mellitus. On a diet of 300 grammes of carbohydrate with as much fat and protein as she likes, and with sufficient zinc protamine insulin to keep her free from glycosuria, she is improving; so much so that a subtotal thyroidectomy will be possible in the near future.

The advantages of an increased carbohydrate diet are:

1. Patients feel much fitter, both physically and psychologically, as the diet approximates to that of an ordinary healthy individual and is more correctly balanced.

2. Life is made easier for them. The modern diabetic can stay at an hotel, and with care is able to choose his food from the ordinary menu; the child can have his meals at the family table, provided he keeps within his fixed ration of carbohydrates, which is now a satisfying one.

3. The chances of hypoglycaemia occurring, which the diabetic dreads, are much lessened.

4. The occurrence of ketosis is much decreased.

5. It has been claimed that an increased carbohydrate diet with a relative decrease of fat lessens the incidence of arteriosclerosis, which is such a common complication of diabetes in later life. This, however, is too large a subject to be referred to any further here.

The simplest method of arranging the diet for a diabetic is, I find, the Lawrence line ration scheme. The number of black lines to be taken, each containing ten grammes of carbohydrate, is settled for each patient. At first this food is weighed, but later on the patient can guess the amount with sufficient accuracy. The number of the red lines containing fixed amounts of fat and

* The substance of the Presidential Address delivered before the Derbyshire Branch of the British Medical Association, June 23, 1937.

protein can be neglected unless the patient is obese, the amount taken being left to him, according to his appetite. Thus there are no difficulties in calculating elaborate diets which many patients in the past never understood.

Action of Soluble Insulin

Insulin has a profound effect in lowering the concentration of the sugar in the blood. How this is done is, however, not quite understood. The time relations of its action and of its duration are fairly constant and do not depend on the size of the dose, though the extent of the fall of the sugar in the blood does. The blood sugar begins to fall within fifteen to thirty minutes after injection; the insulin then acts with its maximum force for three to six hours, and its effect has worn off by the end of eight to ten hours. Practically all young patients with diabetes mellitus, and about three-quarters of the middle-aged patients, need insulin.

Diabetes in young and middle-aged people can generally be controlled during the day with one, two, or even three injections of insulin, but in severe cases the glycosuria usually returns during the night, and ketosis may even occur; and if attempts are made to check the nocturnal glycosuria by increasing the amount of insulin there is a great danger of hypoglycaemia occurring when the patient is asleep.

The New Insulins

It has for some time been realized that for these cases of diabetes in which the glycosuria cannot be controlled for twenty-four hours an insulin whose action will last longer is needed. Although much research had previously been done, it was not until 1934 that Hagedorn in Copenhagen found that if insulin is mixed with a protamine, a special type of protein derived from trout sperm, a precipitate is formed which if injected into the subcutaneous tissues has the same effect as ordinary insulin, but is absorbed more slowly, comes into action later, and is more lasting in its effect. This suspension of protamine and insulin is known as "insulin retard." It is absorbed so slowly that it has no appreciable action on the blood sugar for one and a half to three hours after injection. It exerts its maximum action in from six to ten hours, and this ceases after twelve to eighteen hours.

The most recent advance has been that by Scott of Toronto in 1936. He found that if a trace of zinc is added to the "insulin retard" a yet more stable and less soluble insulin is formed, which if injected subcutaneously after shaking is more slowly absorbed; consequently its effect lasts still longer. It is called zinc protamine insulin. It has no appreciable action on the concentration of the sugar in the blood for three to six hours following the injection, after which it slowly begins to work, exerting its maximum effect in from eight to twelve hours. In moderate doses its action lasts from fourteen to twenty-four hours, and in larger doses it has worn off in thirty hours. In practice, however, the insoluble insulins do not act always quite so exactly: there may be a little variation; they may either come into action a little earlier or their effect may be delayed.

Advantages and Disadvantages of the New Insulins

There are certain advantages, but also disadvantages, in using zinc protamine insulin instead of soluble insulin. The following are the chief advantages:

1. Zinc protamine insulin lowers the blood sugar, and owing to its slow action should control it not only during part of the day but in most cases during the night also; consequently no glycosuria and ketosis should occur during the night, as so often happens in patients treated with soluble insulin. In many cases only one injection in twenty-four hours is necessary.

2. The high carbohydrate diet can be spread more evenly over all the meals instead of confining the bulk of it to those following the injections of soluble insulin.

3. Owing to the slowness of the absorption of zinc protamine insulin no sudden reduction of blood sugar will take place, so that the not infrequent hypoglycaemic attacks in diabetics treated with soluble insulin occur with much less frequency. This is a great advantage, especially in diabetics in whom exercise is followed by attacks of hypoglycaemia.

4. Patients who have been treated with both soluble insulin and zinc protamine insulin say they have a greater sense of well-being with the latter. Possibly this is because of the better control of the glycosuria, the absence of hypoglycaemic attacks, and the need for only one injection a day.

There are, however, certain disadvantages in the use of the newer insulin:

(*a*) Since the less soluble insulin is absorbed more slowly it will take longer to come into action—at least from three to six hours. Thus if it is given before breakfast, as is generally the case, the effect of the zinc protamine insulin taken the previous day will very likely have worn off; if not, then the patient has been given too much, for any post-breakfast glycosuria should not be controlled by the zinc protamine insulin which was given the day before. Consequently, as for three to six hours there will not be enough insulin in the blood stream to deal with the sugar absorbed from breakfast, the concentration of sugar in the blood will rise and glycosuria will occur. In such cases the most satisfactory way of dealing with the difficulty is to give along with the zinc protamine insulin, in the same syringe, a requisite dose of soluble insulin. This will act within fifteen to thirty minutes of the injection, and its effect should last until the zinc protamine insulin starts to act.

(*b*) As the newer insulins are less soluble the rate of absorption, being dependent on the state of vascularity of the tissues into which they are injected, may vary a little from day to day, and consequently so may the concentration of the blood sugar.

(*c*) It is true that hypoglycaemic attacks are not nearly so common in the cases treated with the less soluble insulins, but when they do occur they are much more severe and dangerous, coming on without warning and taking the form of convulsions or sudden unconsciousness, without any of the premonitory symptoms such as sweating, dizziness, etc. Further, these attacks of hypoglycaemia come on later than do those which are due to an excess of soluble insulin, because zinc protamine insulin takes longer to exert its maximum effect. Thus if an injection is given before breakfast, the attack, if it does occur, will take place some time during the following night when the patient is asleep.

Treatment of Hypoglycaemic Attacks

The important thing is, of course, to prevent these attacks from occurring. The stabilization of a patient with zinc protamine insulin should, with our present knowledge, be undertaken only in an institution where the patient can be under proper supervision and where adequate urinary and blood examinations can be carried out. Any increases in zinc protamine insulin must be made with caution and at not less than three-day intervals. A high carbohydrate diet should also always be given and a carbohydrate meal be taken at bedtime.

To prevent the danger of nocturnal hypoglycaemia it has been suggested that the insoluble insulin be given at night alone, with a carbohydrate meal. The disadvantage of

this is that the blood sugar cannot then be controlled during the night. I have not used this method.

The best treatment when a severe hypoglycaemic attack does occur consists of intravenous injections of dextrose, as the patient will be unable to swallow. Improvement will follow, but relapses are apt to occur, and several injections may be necessary before the patient is fully restored.

Conclusions Drawn from the Use of Zinc Protamine Insulin and High Carbohydrate Diets

As it is now some time since the appearance of the original papers describing the action of the less soluble insulins the publication of further information which may or may not support the claims made for them may be considered opportune.

My own experience with zinc protamine insulin is confined to twenty-five patients, all of whom, with the exception of the obese, are taking a high carbohydrate diet and have been carefully stabilized either in hospital or in a nursing home. They are attending the "follow-up department."

I have found it possible to keep all the mild cases of diabetes needing insulin well controlled, in good health, and free from symptoms on one dose of zinc protamine insulin, given once a day before breakfast. In the more severe cases the blood sugar was kept within normal limits during the later part of the day, and also during the night, with one dose each day. But its slow action was noted, and glycosuria invariably occurred after breakfast; this was abolished, however, with a dose of ordinary insulin given at the same time as the less soluble insulin. One case of glycosuria after dinner occurred in spite of a large dose of zinc protamine insulin. However, on adding "insulin retard" to the original dose this disappeared. Two of the patients suffered from hypoglycaemic reactions after exercise, and on this account their blood sugars had to be kept a little raised. They were given enough zinc protamine insulin to keep their blood sugars within normal bounds, and some soluble insulin was also given at the same time. No reactions have occurred since.

Only one patient in this series, a labourer, has suffered from a severe hypoglycaemic attack. He had been stabilized with 50 units of zinc protamine insulin and 12 units of soluble insulin. Some weeks after leaving hospital he was working on a morning shift, and was given a heavier job to do than usual. Soon afterwards he became unconscious and was admitted to hospital. He responded well to intravenous glucose, but relapsed a little later. However, after the third dose of dextrose he completely recovered.

All these patients appreciate the fact that they need only the one injection each day.

Method of Use of the Newer Insulins

When stabilizing a patient suffering from diabetes, and one who has never before received insulin, it is quite safe to begin with a daily dose of zinc protamine insulin of 20 to 30 units, or 30 to 40 in a more severe case. The injection is generally given shortly before breakfast, and this may suffice to control the disease in mild cases.

It is usually necessary, however, to increase the amount of insoluble insulin, and the simplest check at first is the state of the urine, providing the patient has a normal renal threshold for sugar; (an abnormal renal threshold is, I find, quite common in diabetes, even in the young). The urine is tested every three hours, the patient being told to empty the bladder half an hour beforehand, this specimen being neglected. When the urine is sugar-free the blood sugar may have fallen too low; therefore some periodical blood-sugar estimations are necessary at this stage, the specimens being taken about three hours after the injection of soluble insulin and breakfast; about twelve hours after injecting zinc protamine insulin, when it should be working at its maximum force; and before breakfast next morning, when the effect of the insoluble insulin should nearly have worn off. A blood-sugar estimation is of little use unless its time relation to food and the dose of insulin is known.

One's aim in treating young and middle-aged diabetics is to keep them in good health, with a urine free from sugar and a blood sugar within normal limits. But there are some cases of diabetes—generally severe, especially in young people—in which it is impossible to keep the blood sugar within normal bounds without risk of hypoglycaemia: with these patients the blood sugar is very labile, and they may even alternate between hyperglycaemia and hypoglycaemia on the same dose of insulin. One must be content to let them continue with a somewhat raised blood sugar.

When it is thought desirable to change a patient over to zinc protamine insulin from soluble insulin it is safe to start with the same dose and number of units of the former as the patient was taking of the soluble insulin, but given in one injection. This can be increased if necessary, and a dose of soluble insulin added if there is any glycosuria after breakfast. But one certainly hesitates at present to change over to insoluble insulin the large number of diabetics who are well controlled and in good health with soluble insulin and who do not mind having two injections a day.

In cases of very severe diabetes where there is much ketosis, and also in cases of coma, it has been recommended that the patient should have a large dose of soluble insulin in order to get a quick response, and at the same time an injection of zinc protamine insulin, so that the insulin effect can be prolonged. I find, however, that the best plan is to treat these severe diabetics in the ordinary way with large and repeated doses of soluble insulin alone until the condition has improved, when they can be switched over to insoluble insulin if necessary.

Follow-up of Patients

On leaving hospital, where he has been thoroughly trained to manage his diet and to give himself insulin, the patient must be instructed to see his doctor at regular intervals, or to attend a follow-up department, which should be established at every hospital where diabetes is treated. It is well known that the severity of the disease fluctuates from time to time for better or worse: the sugar tolerance may improve; but after some infection or adverse circumstances, and quite often for no apparent reason, the disease may progress. Therefore the amount of insulin may need adjusting periodically. This is a little more difficult to manage with insoluble insulin than with the soluble. With the latter the patient can conveniently attend the follow-up clinic about three hours after his morning dose of insulin, and the blood sugar can be estimated. This gives an idea as to whether or not the dose is suitable. But the optimum time for estimating the blood sugar with zinc protamine insulin taken once a day is before the morning dose. Patients living near the clinic therefore come up periodically before breakfast and the morning dose of insoluble

insulin, and their blood sugars are estimated. Every patient tests his own urine before breakfast about three times a week, and enters the result in a notebook, which is produced each time he attends the follow-up clinic. I find little difficulty in persuading patients to attend the clinic regularly. It is only by careful clinical and chemical after-care that the diabetic can be kept in good health and the disease held in check.

Treatment of Elderly Diabetics

The treatment of diabetes in elderly people is rather different from that which is adopted in the case of the young or middle-aged, since arteriosclerosis is so often associated with the disease, and may appear to be the primary condition. In such cases symptoms of diabetes may be absent, so that the condition may not be discovered until a routine examination is made for some other complaint, often one due to the cardiovascular, ocular, or central nervous system. If, however, the diabetes is allowed to continue unchecked symptoms will very likely occur, and ketosis and even coma may follow, though not so commonly as in younger people; but I have during the past year seen one patient with diabetic coma and two on the verge of it who were over 65 years of age.

In elderly people diabetes unaccompanied by ketosis should not be treated too energetically by great restriction of carbohydrates, or by large doses of insulin with the idea of lowering the blood sugar to the so-called normal values and rendering the urine free from sugar for the whole of the twenty-four hours, because they will certainly not feel so well, and their general condition, including quite possibly their heart muscle, will deteriorate. On the other hand treatment must not be neglected: judicious limitation of diet of all kinds, especially if the patient is obese, together with increased exercise and possibly thyroid, and insulin in selected cases, will help. Zinc protamine insulin with its slow action is very useful for elderly patients who need insulin.

The criterion of improvement in patients suffering from diabetes associated with arteriosclerosis is certainly not determined in the laboratory by finding a urine free from sugar and a blood sugar of normal value, because the normal level of the blood sugar may not be the ideal. Rather it is the general clinical improvement, with absence of symptoms, at which one must aim in treatment.

Conclusion

With regard to the value of the newer and less soluble insulins, whilst they have passed the purely experimental stage and are ready for clinical use, nobody yet has sufficient experience to lay down hard-and-fast rules. At present one can only indicate how they are used, try them out on suitable cases under proper control, and note the results. The time is hardly ripe to decide whether or not they are a success. The newer insulins are powerful weapons with certain dangers, and therefore should not be used except with proper precautions, and their effects suitably controlled so that serious hypoglycaemic attacks may be avoided.

Although one must not generalize from this small series of cases which have been investigated personally and treated with high carbohydrate diets and zinc protamine insulin, yet my experience is that in suitable cases, with the proper use of the newer less soluble insulins, a step forward has been made in the treatment of diabetes mellitus.

PERSISTENT OVERMOULDING OF THE SKULL BONES CAUSING FITS IN AN INFANT

BY

G. C. GORDON, M.B., Ch.B.

(WITH SPECIAL PLATE)

A female infant 14 days old was admitted to hospital with a history of one fit, occurring approximately an hour before admission.

Case Report

When first seen the child was very pale and rather drowsy, and lay perfectly still with closed eyes. Its temperature was 97.8° F., the pulse rate 138, and respirations 26. The mother said that the pregnancy had been normal and full-time. On March 29, 1937, the membranes ruptured; labour pains began at 11 p.m., and the child was born at 11.55 p.m. the same day. It weighed 7 lb. 8 oz. No instruments were used. The child cried after birth, but the mother stated that on being washed it made a "curious noise" for the rest of the night. Afterwards it became abnormally quiet, and was continually drowsy without remission. The infant had to be "wakened" for every feed, and did not suck satisfactorily. Although fed every three hours its weight dropped to 6 lb. 1 oz. The stools had been normal since birth.

This was the second child, the first being a healthy, normal boy, now 3½ years old. There was no history of illness or fits, and there had been no miscarriages. Investigation of the family history of both father and mother revealed no specific disease, epilepsy, or other illness which might have a bearing on the child's condition. The mother was Wassermann-negative.

Soon after admission another fit occurred. The child suddenly became deathly pale, the pulse and respiration were imperceptible, and the lips took on the light bluish coloration usually seen in death. The limbs were flaccid, and not the slightest muscular movement could be observed; the eyelids were peacefully closed and the child did not cry out—in other words it appeared to be dead. Very slight movement of the chest could be seen on close examination, and the heart sounds were slow and almost inaudible. Oxygen was administered, and after two minutes the colour improved and pulse and respirations returned to normal.

A complete examination failed to show any pathological change. The stools were offensive and relaxed. No abnormality of the heart was present, and between fits examination revealed no lesion of the central nervous system, the child having full use of its limbs with no apparent sensory loss. The temperature was found to be invariably subnormal during the fits, and at no time did pyrexia occur. The usual causes of convulsions and fits were ruled out one by one, and further cause had to be sought. The skull bones were seen to be persistently overmoulded, the frontal and occipital bones being inserted below the parietals, with complete obliteration of both anterior and posterior fontanelles. In view of this a provisional diagnosis of slight cerebral haemorrhage, causing irritation and pressure on the brain without paresis, was made. The frequency of the fits increased, however, and during the period from the fourth to the eighth day after admission they were almost continuous. Their length varied from fifteen seconds to two minutes roughly, with an interval between each of from five to fifteen minutes. All the fits were similar to the one previously described, and it was noticed that they were prone to occur immediately after feeds or when the child was handled.

Since admission almost all feeds had been vomited. Starving, rectal wash-outs, stomach wash-outs, and the usual methods of treatment were carried out, but they failed to allay this symptom. In consequence the child lost 1 lb. 4 oz. in seventeen days, dropping to 4 lb. 13 oz. By a combination of rectal salines with glucose and frequent feeding with a pipette enough nourishment was given to keep it alive.

On the eleventh day after admission the fits ceased, but the child was now very weak and continued to vomit occasionally. By careful feeding the general condition improved and the infant gained weight, reaching 5 lb. 10 oz., but on the twenty-first day after admission continuous fits occurred for two hours, resulting in a loss of 10 oz. in the following week. During the quiet period the stools had been normal, but after the second series of fits they became green and offensive again. Following this the fits and vomiting ceased completely, and after an interval of a week weight was gained rapidly. Repeated examination failed to reveal any pathological condition. It was noticed at this time that the overmoulding of the skull bones was not quite so marked as at first, and a very small anterior fontanelle could be felt. Also the child made no attempt to grip anything, and paid no attention to the feeding-bottle. Examination revealed that it was blind.

Commentary

No muscular paresis or cutaneous sensory loss had become evident throughout the course of the illness, and in view of the nature and frequency of the fits I came to the conclusion that they were directly due to the persistent overmoulding of the skull bones causing pressure on the brain when physiological increase of the cerebrospinal fluid occurred. The points on which I base my diagnosis are that the fits were of an unusual nature and that they appeared to be due to a depression of vital centres in the brain rather than to irritation or reaction caused by toxic products of any pathological condition.

Although the stools were green during the first series of fits and a gastro-intestinal condition might be inferred from this, there was no rise in the temperature and none of the usual signs of toxaemia. Also the stools were normal between the eleventh and the twenty-first day of admission, and only became green again after the short second series of fits, being an effect and not a cause of the fits. The pulse rate did not rise above normal. The fits were not of an epileptiform nature, and the family history was devoid of any stigmata.

The provisional diagnosis of slight cerebral haemorrhage due to overmoulding and possible rupture of the tentorium cerebelli was untenable in view of the continuous fits combined with the non-appearance of paresis. Also the blindness points to general cerebral pressure rather than to local irritation caused by haemorrhage.

It is reasonable to assume that after feeds or during handling of an infant there is a physiological increase of cerebrospinal fluid pressure, and since the fontanelles are obliterated, the tentorium cerebelli stretched taut, and the anterior and posterior fossae encroached on by the persistent overmoulding, any increase of pressure would exert its full effect on the brain, causing vomiting. In addition the medulla oblongata would be lower than normal, extending approximately to the foramen magnum, and the increase of pressure would tend to force it further down, causing pressure on the vital circulatory, respiratory, and heat-regulating centres in the medulla. Lumbar and cisternal puncture would thus be contraindicated. Exception might be taken to this view on the grounds that such dislocation of the medulla does not occur in hydrocephalus, but in that condition the fontanelles and sutures are open, and any rise in pressure would be taken up by the lax tissues until the skull bones adjusted themselves to the increased calibre of the brain.

With regard to the late appearance of the fits, it is probable that the rather precipitate birth and consequent sudden overmoulding of the skull bones caused a severe degree of shock, resulting in a lowered blood pressure and decreased secretion of cerebrospinal fluid, the fits only appearing when the child began to recover and normal function was restored.

Rectal salines would seem to be contraindicated, but starvation did not allay the fits, and it became obvious that their occurrence after feeding had to be accepted or the child would die from lack of nourishment.

The blindness is probably due to optic neuritis following on the intermittent pressure. Light reflex and accommodation are normal, and there is no paralysis of ocular muscles.

There has been no recurrence of fits or vomiting; the child weighs 7 lb. 14 oz., and cries lustily on occasion. It has the full use of its limbs, with no apparent cutaneous sensory loss. The anterior fontanelle is now about half an inch wide; the posterior fontanelle is non-existent, and the moulding much less than on admission. The blindness is improving.

The *x*-ray plate shows the overlapping bones, the photographs being taken when the child was 3 months old.

CHRONIC DISSEMINATED TUBERCULOSIS

ILLUSTRATED BY A CASE OF CORTICO-PLEURAL DISEASE

BY

F. A. H. SIMMONDS, M.A., M.B., D.P.H.

AND

W. PAGEL, M.D.

(From the Middlesex County Sanatorium, Clare Hall, and the Sims Woodhead Memorial Laboratory, Papworth Village Settlement)

(WITH SPECIAL PLATE)

The primary complex resulting from the first infection with the tubercle bacillus and the established stage of phthisis are clearly defined and familiar conditions. So are some of the results of haemic dissemination such as acute miliary generalization, meningitis, and tuberculous disease of the bones. Chronic haematogenous tuberculosis of the lungs is not so well known, but it deserves particular attention, for there are good reasons for thinking that it may be the precursor of other important conditions. Either it may for a time remain abortive, and after recrudescence and local invasion of the bronchi precede and produce ordinary (bronchogenic) phthisis, or more directly and within a shorter time it may develop into a chronic pulmonary condition superficially resembling ordinary phthisis but having its own characteristic features. Hence chronic haematogenous disease of the lung may present itself in a variety of ways, which Pagel (1933) has classified and described in detail. These generalized forms of tuberculosis, which include the so-called chronic miliary tuberculosis, show distinctive features in the lungs, which Sayé (1937) thus summarizes: "There is constant involvement of the lungs, in which the lesions assume both as regards situation and stage of development a symmetrical lobar distribution. . . . One finds fibrous miliary lesions and hyperplasia of the interstitial tissue, and marginal distribution, diffuse interstitial emphysema, caseous pleurisy, and a special type of cavity—'dry, not surrounded by dense lung tissue, round thin-walled (Lochkaverne).' These cases nearly always die of meningitis or acute miliary tuberculosis." The determining cause of death is therefore the last overwhelming discharge into the blood stream of bacilli which have most probably

been previously distributed in smaller doses and on rare occasions: thus in the series of post-mortem reports of twenty-one cases studied by Hoyle and Vaizey (1937) tuberculous meningitis was reported in nine. The case to be described belongs to this group, showing disseminated miliary lesions which in the lungs were distributed in the periphery and along the fissures—an example of the form first described by Pagel as cortico-pleural chronic miliary tuberculosis (op. cit., p. 282), and recently studied by Stefko (1936).

Case History

A male clerk, aged 45, was admitted to the sanatorium on July 27, 1937, obviously very ill, with typical signs of meningitis, and died two days later. In addition to the signs of meningeal disease a pleural rub was heard on the left side of the chest, where the percussion note was impaired. No tubercle bacilli were found in the sputum.

History.—The patient's sister said that he had been in good health until March, 1937, when he had "sciatica," but was well again in April. Early in June he complained of headache, shivering, and severe vomiting, with night sweats, and slowly became worse till admission. A radiograph taken on June 30 showed shadows typical of miliary tuberculosis and obliteration of the left costo-diaphragmatic angle.

Necropsy.—There was moderate wasting. Examination of the brain revealed an excess of cerebrospinal fluid, with congestion of vessels and miliary tubercles in the region of the middle cerebral artery. The left pleura was reddened with vascular injection, and between the parietal and visceral layers were universal fine adhesions easily separable by the hand. Section of the lungs revealed miliary tubercles, but with a special distribution. These tubercles were confined to the periphery of the lungs to a depth of about an inch, and lining the pulmonary fissures in a similar manner. Equally striking were the numerous tiny interstitial emphysematous bullae; they were of varying size, but the largest appeared as a small cavity about half an inch in diameter with smooth glistening walls. The kidneys contained a few scattered miliary tubercles, but the spleen, though softened and enlarged, showed none to naked-eye inspection. A stony calcified mass an inch in diameter was found in the mesentery.

Histological Examination.—The nodules were found to consist of small caseous centres with extensive peripheral proliferation of epithelioid cells, lymphocytes, and fibrocytes. In addition there were areas showing exclusively proliferative reaction in the form of small epithelioid cell nodules surrounded by "collapse induration"—that is, collapsed alveoli with fibrotic interstitial tissue. Histological examination therefore showed that this was certainly *not* an acute process, but one with a definite tendency towards healing or a chronic course at every individual focus (see Plate).

Commentary

Although the clinical history available and the radiograph seemed to indicate that acute generalized miliary tuberculosis would be demonstrated at necropsy, the actual findings suggest a chronic course of the pulmonary lesions, both from the restriction of the miliary foci to the cortico-pleural area and from their macroscopic and microscopical appearance.

One may ask if the pleura exercises a localizing influence on blood-borne tuberculous lesions, and the frequent involvement of the pleura, in the form of idiopathic pleurisy, supports this suggestion. Another explanation, recently upheld by Stefko, is that the pleural lymphatics may be the path of spread, but a closer connexion of the pulmonary nodules and the pleural lesions than was found in the present case ought then to result. Again, experimental work by one of us has produced a chronic haematogenous lesion of the cortico-pleural area in rabbits by intravenous injection of virulent bacilli after previous immunization of the animals by infection with living avirulent or killed bacilli; the final distribution of the lesions in these animals was the result of absorption of the more central lesions (Pagel, 1936).

It may also be noted that a radiograph which shows a fine mottling in all fields may be a shadow picture of purely cortical lesions, and in such case a tomographic film might give better diagnostic help: evidence of former pleurisy would stress the need for this extra investigation, since its presence may be an indication of the chronic nature of the miliary disease.

Summary

A case of cortico-pleural chronic miliary tuberculosis is described, with the post-mortem examination. The relation of this condition to other forms of pulmonary tuberculosis is discussed.

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FRACTURE OF THE NECK OF THE FEMUR

ANOTHER METHOD OF INSERTING THE SMITH-PETERSEN PIN

BY

H. B. RODERICK, O.B.E., M.A., M.D., M.Chir., F.R.C.S.

Surgeon and Orthopaedic Surgeon, Addenbrooke's Hospital; University Lecturer and Examiner in Surgery, Cambridge

(WITH SPECIAL PLATE)

The insertion of a Smith-Petersen pin has now become the accepted method of treating fractures of the neck of the femur; but the best means of inserting it is still on trial. Every surgeon who has to deal with these fractures has evolved his own technique, and the respective advantages of the "open" and "blind" methods have yet to be established. Advocates of both methods claim superiority for the one or the other practice, and until experience has proved either of them to be of outstanding merit for the majority of cases it will continue to be of interest to hear of any method which has been consistently successful in any one surgeon's hands. This being so, I venture to describe a method I have evolved which, although "open," may be described as a compromise between the "open" and the "blind" operations, in that it does not expose the fractured ends, which are still protected by the strong anterior ligament of the hip-joint.

The Technique

For my purpose I have designed a director—made for me by the Medical Supply Association—which when placed against the outer surface of the femur at the correct level gives the angle for the insertion of the pin in relation to the long axis of the bone. The lateral plane is gauged by setting the director-edge parallel to a straight instrument laid along the flat front surface of the neck. This will be made clear by reference to the Special Plate.

The patient is placed on a Hawley table and the deformity corrected by the usual Whitman manœuvres. A radiograph is taken to check the position. While the film is being developed the field of operation is prepared and arranged. A lateral incision about six inches long is made, and the great trochanter and shaft of the femur are reached by muscle-splitting. The director is inserted and laid against the shaft of the femur, its upper end being on a level with the lesser trochanter, or two and a half inches below the tip of the greater trochanter. A long, narrow, straight instrument (I generally use a long Spencer Wells forceps) is passed up along the side of the director and placed against the flat anterior surface of the neck of the femur. The director is adjusted so as to lie parallel to the forceps, and is thus in correct position for both planes of the neck. A Kirschner wire is now laid in the groove on the upper surface of the director (held by the assistant) and drilled in.

A second radiograph is taken to check the position of the wire. A pin is now threaded on to the wire and rests on the director. A metal hammer is also threaded on and the pin is driven home. The pin resting on the firmly held director obviates the risk of bending the guiding-wire, which many surgeons have reported and which renders it impossible to remove the wire afterwards. The wound is stitched up, and a third radiograph can be taken to check the result.

Results

The accompanying Table gives the results of sixteen cases treated in this way. Eleven have been quite successful and the patients are walking about with normal gait,

Table showing Results in 16 Cases of Fractured Neck of the Femur

Case No.	Age	Sex	Accident	Operation	Walking	Result
1	18	M	20/10/35	24/10/35	18/11/35	Good. Pin removed 9/3/36
2	60	F	2/12/35	4/12/35	28/12/35	Good
3	56	F	13/12/35	16/1/36	Pin slipped.	Has firm union ¾ in. short
4	57	M	22/12/35	1/1/36	1/2/36	Good. Pin removed 29/4/36
5	30	M	20/12/35	15/1/36	6/2/36	Good. Pin removed 1/7/37
6	63	F	29/3/36	3/4/36	15/7/36	Good
7	65	F	28/4/36	30/4/36	Died of pulmonary embolism 9/5/36	
8	61	F	30/5/36	1/7/36	23/8/36	Good
9	55	M	6/5/35	8/7/36	14-months-old fracture. Neck absorbed. Pin slipped. Refused further treatment	
10	59	F	21/7/36	27/7/36	10/9/36	Good
11	68	F	4/10/36	21/10/36	5/1/37	Good
12	46	F	4/11/36	11/11/36	18/12/36	Good
13	42	F	9/12/36	22/12/36	2/2/37	Good
14	44	F	31/1/37	8/2/37	6/3/37	Good
15	77	F	31/1/37	11/2/37	Died pneumonia 24/2/37. Pin found firmly fixed in head in good position	
16	74	F	31/1/37	19/5/37 10/6/37	Neck absorbed. Pin slipped. Pin reinserted. Walking 8/9/37	

some of these cases being of nearly two years' standing. I have removed the pin in three instances, but the other patients are disinclined to undergo the slight operation for its removal, as they have so far experienced no inconvenience from its presence. Of the remaining five patients, one died of pulmonary embolism on the tenth day, and one, an old lady of 77, of pneumonia on the thirteenth day. In this case post-mortem examination revealed the pin firmly fixed in the head of the bone in excellent position. Had these two patients lived it is fair to presume that they would have shown successful results. Case 3 was a failure as a pinning operation because the pin slipped. This patient attempted suicide and fell from a first-floor window, sustaining a double Colles's fracture and a comminuted fracture of the neck of the femur near the base, from a direct blow on the greater trochanter. She now has firm bony union and can walk any distance, but has three-quarters of an inch shortening. Case 9 came under my care fifteen months after the accident. This patient had been treated unsuccessfully in a Whitman plaster. The neck was absorbed and the head atrophied. The pin worked out of the head. I proposed reintroducing the pin and driving it on into the acetabulum, but the man refused further treatment. The last case was that of a woman of 74 who had sustained a fracture of the neck four months before coming under my care. In her case the neck is absorbed, and in my first attempt the pin did not secure a firm hold of the head. I reinserted the pin some three weeks later and she is now starting to walk, but it is as yet too early to say how successful her case will prove to be.

Clinical Memoranda

An Unusual Case of Chondrification of the Patellar Ligament

(WITH SPECIAL PLATE)

Although cartilage formation in torn muscles and tendons is fairly common the following case is of interest owing to the extent and site of the chondrification. I am indebted to Dr. Killpack of Haywards Heath for the history.

The patient, a boy 12 years old, had fallen and injured his left knee on June 11, 1937, and was admitted to Haywards Heath Hospital. On examination the patella was found to be dislocated. The outward displacement was easily reduced, but some upward displacement remained. The boy volunteered the information that the left knee had been "large and wobbly" for many years. He later developed an acute tonsillitis, and tonsillectomy was performed on July 7. As his knee was still very painful he was transferred to the Royal Alexandra Hospital, Brighton, under my care.

The radiographic report on the left knee stated that the lower angle of the patella was torn off and had separated for fully half an inch. At operation, on September 8, the patella was found to be quite normal, but the patellar ligament was torn off from the lower border of the patella. Embedded in this ligament was a large cartilaginous mass, which was excised (see Plate). The articular surfaces of the femur and tibia were normal. The patellar ligament was then firmly anchored to the patella and the wound closed. Recovery was uneventful.

The specimen was 1¾ by 1¼ inches, and consisted of cartilage with a bony centre. Its shape was not unlike that of a normal patella.

J. M. TURNER, F.R.C.S.,
Honorary Orthopaedic Surgeon,
Royal Alexandra Hospital.

Hove.

A Swallowed Pin and a Round-worm

The following case may perhaps be considered interesting enough to be placed on record.

CASE REPORT

The patient, a boy of 8 years, swallowed the sharp half of a collar-pin, and was admitted to hospital an hour or so afterwards. The abdomen was screened immediately, and the foreign body was seen to lie somewhere in the small intestine. The sharp end of the pin was fixed and immobile, while the other end was noticed to move in a peculiar jerky, to-and-fro fashion which was quite inexplicable.

Laparotomy was performed and the pin located in the ileum. On removal a large round-worm was found to have protruded its head through the hole in the blunt end of the pin to such an extent as to become fixed therein. The peculiar movements of the pin as seen under *x* rays were thus explained. I enclose a photograph of the worm and pin as they were withdrawn from the intestine.

I am indebted to Dr. De Souza, who operated on the case, for permission to report it.

R. WALSH, M.B., B.Ch.,
Merthyr General Hospital. Resident Medical Officer.

Recurrent Hydatid Cyst

The occurrence of secondary echinococcosis following rupture or puncture of a hydatid cyst is well substantiated both clinically and experimentally (Dew, 1930–1), but there do not appear to have been many opportunities, at least in this country, of observing the results of such a process at a second laparotomy in the human subject. In this light the following case of recurrence of hydatid cyst may be of some interest.

CASE REPORT

A woman aged 20 was admitted to a surgical ward in Dundee Royal Infirmary on April 26, 1927, on account of acute pain in the right hypochondrium radiating to the back and right shoulder. A similar attack had occurred three weeks before, and lasted for five days. Both these attacks were attended by jaundice and bilious vomiting. On admission a rounded tumour, tender and freely movable, was palpable below the right costal margin. The pain slowly settled, and on May 10, 1927, laparotomy revealed a cystic tumour in relation to the right lobe of the liver, adherent to the small intestine and to the transverse mesocolon. The cyst was dissected free and excised, but is said to have been perforated during dissection. Recovery from the operation was without incident; pathological examination showed the cyst to be a typical hydatid, with numerous scolices but no secondary cysts.

The patient next came under observation on February 17, 1937; the intervening ten years had been uneventful, save for an attack of urticaria in the summer of 1936. The first unequivocal sign of recurrence was a typical attack of biliary colic, accompanied by jaundice and vomiting, following which she was admitted to Dundee Royal Infirmary. When examined on February 22 she was jaundiced but showed no urticaria and had no itching of the skin. Her temperature was 96° F. and her pulse rate 66. There was neither tenderness nor muscular rigidity and no general abdominal distension, but a soft rounded tumour was palpable in the right iliac fossa. The patient's general condition was good. Blood examination showed: haemoglobin, 104 per cent.; red cells, 5,300,000 per c.mm.; leucocytes, 9,200 per c.mm. The differential count was: polymorphs, 6,800 (74 per cent.); lymphocytes, 1,288 (14 per cent.); eosinophils, 550 (6 per cent.); basophils, 180 (2 per cent.); large monocytes, 360 (4 per cent.). A radiograph of the lower chest and upper abdomen failed to reveal any cyst.

On March 4 laparotomy was performed by Mr. F. R. Brown, a right paramedian incision being made. The greater omentum was found to be adherent to the abdominal wall and to the lower surface of the liver. A thick-walled ovoid cyst 5 by 3 by 2½ inches was found in the right iliac fossa, and was removed by dissection from the small bowel and ascending colon. A second cyst was observed embedded in the left lobe of the liver, but as access to this from below was poor a transverse incision was made on the left side, just internal to the mammary line and at the level of the tenth rib; two inches of rib were resected and the peritoneum incised to expose the left lobe of the liver. Visceral and parietal peritoneum were sutured together and a paraffin-flavine pack inserted. The abdominal wound was closed. Four days later the exposed surface of the liver was incised with the diathermy knife, and typical hydatid fluid with numerous daughter cysts escaped; a thick yellow lining membrane was extracted and the cavity washed out with 1 per cent. formalin. The cavity was flushed out daily with eusol, first through a rubber tube drain and later through a catheter. Discharge of daughter cysts and bile-stained fluid persisted till May 20; thereafter the wound healed satisfactorily, and had completely closed by July 1.

During the earlier weeks after operation the patient had two febrile attacks, each lasting for less than twenty-four hours. In one of these the temperature rose to 102.8° F.; this was accompanied by a rigor and transient jaundice. Each attack was followed by the escape of a daughter cyst through the wound. On April 24 an injection of lipiodol was made into the sinus: this showed up an irregular cavity in the left lobe of the liver communicating with the bile ducts. A series of films was taken, and lipiodol was seen to have reached the small intestine in one and a half hours. After twenty-four hours no lipiodol was present in the liver. On April 28 a differential count showed only 2 per cent. of eosinophils; and on May 12 an intradermal test with 0.2 c.cm. of sterile hydatid fluid was negative.

The patient was discharged on June 11, free from jaundice and abdominal pain. She has since been seen as an outpatient on several occasions, and the improvement is being maintained.

COMMENTARY

The original source of hydatid infection is obscure; other members of the family are healthy, and the patient has never lived in an area where hydatid disease is common. No dog has been kept in the household.

The main point of interest is the length of time that elapsed between the first laparotomy, at which peritoneal implantation presumably occurred, and the earliest appearance of symptoms of recurrence. Even after ten years' growth the cysts were not of exceptionally large size, a finding which lends support to the view (Madelung, loc cit.) that in most cases hydatid infection occurs in childhood, the usual lack of symptoms until early adult life being due to the slow growth of the cysts.

DOUGLAS A. K. BLACK, M.B., Ch.B.,
Dundee Royal Infirmary. House-surgeon.

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Reviews

ORGANIC NERVOUS DISEASES IN YOUNG PEOPLE

Diseases of the Nervous System in Infancy, Childhood, and Adolescence. By Frank R. Ford, M.D. (Pp. 954; 107 figures; 14 tables. 38s.) London: Baillière, Tindall and Cox. 1937.

We have learnt to expect only the best from the Johns Hopkins University, and Professor Ford has not fallen short of the high standard set him by this great medical school. He has compiled a most complete textbook of the organic nervous diseases which beset children and young people. This is more than a compilation however, for although the bibliographies at the end of each section bear witness to the erudition which this volume represents the author quotes his own experience and judgments wherever possible, thus giving a personal flavour which many textbooks of this magnitude lack. Charts, tables, illustrations, and case-histories illuminate the systematic descriptions of the many different conditions that are brought under review.

A complete guide to all modern methods of examining the nervous system is contained in the first chapter. This is followed by a discussion of the clinical anatomy and physiology of the system, and in this chapter is included a most useful description of the embryology, morphology, and clinical physiology of the immature nervous system. Next the pre-natal diseases are dealt with, and here are included all the various congenital anomalies of development which are manifest at birth. The heredofamilial and degenerative conditions follow naturally on this; and the great multiplicity of syndromes which, if they have done nothing else, have enshrined the names of so many distinguished neurologists are set out in order. This leads to the infectious and parasitic invasions of the nervous system, divided into sections comprising virus diseases, bacterial infections, invasions by moulds, yeasts, Rickettsiae, spirochaetes, protozoa, and parasitic worms.

Under the heading of toxic and metabolic disorders involving the nervous system we find described the neurological complications of the exanthemata and other more general diseases, of exogenous poisons, metallic and otherwise, of endocrine and metabolic disturbances, and of dietary deficiencies. Vascular accidents and the effects of abnormalities of the circulation as they occur in young persons are next described, and this section is followed by one devoted to neoplasms and related conditions. Trauma is dealt with both as it occurs at birth and subsequently, and sunstroke and injuries from lightning and electric currents are not omitted from this category. The epilepsies and the paroxysmal disorders of the nervous system are fully discussed, and this concludes the systematic description of the diseases and injuries of the somatic nervous system. A chapter is devoted to diseases of the autonomic nervous system and another to diseases of muscles. Finally there is a very useful chapter on syndromes and symptom complexes, such as cerebral spastic paralyses, spinal spastic paralysis, ataxias, disturbances of speech function, and disturbances of vision.

From the brief indications given above it will be obvious that this work is exceedingly comprehensive, and it must prove a most valuable work of reference for all neurologists, paediatricians, and orthopaedists. To these and all other medical men interested in children it can be most warmly recommended.

ENCYCLOPAEDIA OF MEDICAL PRACTICE

The British Encyclopaedia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynaecology, and Other Subjects. Volume 5. *Endoscopy of Respiratory Tract to Goitre.* Under the general editorship of Sir Humphry Rolleston, Bt., G.C.V.O., M.D. (Pp. 632; 139 figures. 35s. net.) London: Butterworth and Co. (Publishers) Ltd. 1937.

The fifth volume of this impressive work comprises the subjects from endoscopy to goitre. Enteric fever and glandular fever are two of the infectious diseases which are included. The differentiation of groups, the isolation of separate bacteria, and the successful application of the principles of immunity to the problems of diagnosis and prophylaxis, combined with an awakening sense of public duty in providing pure water and preventing the contamination of food, have produced a remarkable diminution in the incidence of enteric fever during this century, and the subject now lends itself to the standard description given by Dr. Lakin. Glandular fever, a comparatively new syndrome, with indefinite grouping and unknown aetiology, needing much more work before its position in the medical textbooks is similarly standardized, receives adequate treatment at the hands of Dr. Letheby Tidy, who has made considerable contributions to its recognition and classification. Glanders is rare; German measles common. Erysipelas is notifiable as an infectious disease; Mr. J. B. Hunter recommends the use of benzenesulphonamide compounds, antitoxin, and general supporting measures as well as local applications. Saturated solutions of magnesium sulphate in glycerin have the additional advantage of the hygroscopic effect of the glycerin.

The various articles on skin affections in this volume are valuable, notably that by Dr. Arthur Whitfield dealing in a general and informative way with eruptions, especially those anomalous and atypical rashes which do not fall readily under the usual nomenclature or correspond with the usual descriptions. Dr. Whitfield's classification should help practitioners to recognize these unusual forms. Skin diseases, though so patent to the eye, are not well understood by men in general practice. The series of contributions to the encyclopaedia will prove very useful for reference. Erythema in its diverse forms may be due to many external and internal causes; the description and classification offered by Dr. R. T. Brain should be most helpful, while the full treatment of fungous diseases presented by Dr. W. N. Goldsmith not only draws attention to the diagnosis of the various forms, but offers many alternative plans of treatment for these conditions which so readily become chronic and form a minor source of discomfort and disability. The articles on diseases and injuries of the eyelids and hereditary diseases of the eye are preceded by a succinct account of the methods of routine examination of the constituent parts of the eye and its media. Several inherited eye defects are known, but recent additions to knowledge make it impossible to accept Mendelian laws as a complete explanation of the facts of heredity, according to Dr. Doggart. Some ocular defects are transmitted as Mendelian dominants, some as Mendelian recessives, and others are sex-linked. A minor comment on family trees diagrammatically exposed is that the male sign is more usually and accurately given with the arrow-head pointing upwards and to the right. The tropical diseases included in this volume—fluke and filarial infestations—are in the capable hands of contributors from the School of Tropical Medicine.

This volume begins with two satisfactory articles on endoscopy of the upper respiratory and alimentary tracts,

and of the urinary tract. It is desirable, however, that the modern advances attained by gastroscopy should be dealt with more fully; perhaps the editors envisage a separate article in a later volume. Gynaecological subjects are dealt with by Professor Dougal on affections of the Fallopian tubes, and by Dr. Feldman on deformities of the foetus; and Dr. Russell Brain's account of epilepsy is full and clear. The orthopaedic subjects of diseases and injuries of the epiphyses, and of diseases and deformities of the feet, are capably done, and Sir David Wilkie's article on affections of the gall-bladder and bile ducts is full and informative. Professor Fraser and Sir Thomas Dunhill were the obvious choice of the editors to deal with the present-day position in regard to goitre and diseases of the thyroid gland. Their account of their work together is broad-minded and sufficient in detail, but they would be the last to imply that the present exposition is more than a wayside halt to take stock of the position and plan the survey of extended work in the further fields of interendocrine disturbance.

A noteworthy feature of this volume is the excellence of the articles on psychological medicine. Dr. Charles Myers, dealing with the phenomena of mental fatigue, draws a distinction between mental fatigue as exhaustion and the state of lessened activity known as boredom. Using the physiological data of the spinal-cord reflexes as an analogy, he builds up a theory of cortical and mental fatigue. In the absence of strict knowledge of the causation, but conjecturing that there is a biochemical cause, we at present are driven back upon one common remedy—rest—but this must be coupled with appropriate psychotherapeutic measures. Enuresis has a psychological basis so often that Dr. Moncrieff's article will be of much value to the practitioner, and Dr. Neustatter explains the methods of controlling exhibitionism. Among many useful subjects dealt with, Dr. C. O. Hawthorne's wise words on etiquette and ethics in medical practice can be read and reread with advantage.

THE COSMETIC ART

Manual of Cosmetics. By C. Lazar, M.D. (Pp. 318; 12 illustrations. 12s. 6d.) London: Henry Kimpton. 1937.

For those who are interested in the cosmetic side of dermatology this manual by Dr. C. Lazar will be found quite useful. The author appears to have designed this work not primarily for the medical profession, but for that class of persons, which grows more numerous every year, known as "cosmeticians." He does not content himself with the discussion of creams, face massage, scalp treatment, and the various manipulations to which the beauty parlours of this country usually restrict themselves, but he also gives directions for carrying out numerous procedures of a surgical nature which we like to consider are the prerogative of the medical profession alone. Among other matters Dr. Lazar gives directions for the removal of benign tumours, and he instructs his clientele in the use of surgical diathermy, carbon dioxide snow, the galvano-cautery, and the dental drilling machine.

The dental drilling machine was introduced into cosmetics by Kromayer, and Dr. Lazar recommends it strongly for removing freckles and flat pigmented naevi. A spherical burr is used for this purpose, and he says that if the drilling is carried out slowly it is so painless that it is not worth while using local anaesthetic. He gives very full and explicit directions for carrying out the various little cosmetic operations which he describes, and there is no doubt that many medical men who practise minor surgery will find useful hints for improving their technique and extending their sphere of usefulness if they peruse the manual. Whether, on the other hand, it is safe to put it in the hands of the cosmeticians for whom it is primarily intended, and who have only very sketchy knowledge of the principles of surgery and the pathological possibilities of the human integument, is another matter. In any case it is quite a useful guide to a subject which, though of increasing importance, is usually neglected in the ordinary textbooks of dermatology, and from that point of view it can be recommended. It is worth reading even by specialists in diseases of the skin, who will find in it many useful hints.

BIOLOGICAL MEASUREMENT

Biological Standardization. By J. H. Burn, M.D. (Pp. 288; 64 illustrations. 21s.) London: Humphrey Milford, Oxford University Press. 1937.

We trust that Professor Burn is unduly pessimistic when in the preface to his book he anticipates a poor circulation. On the contrary, we are inclined to predict that for a book of its kind it will be widely read and appreciated. The subject is one of the really vital and progressive branches of medicine and concerns not only medical workers but also druggists and manufacturers. A great change has taken place in the attitude towards biological standardization during the last ten or fifteen years. In 1920 Ehrlich's unit of diphtheria antitoxin was the only serious therapeutic standard in existence. It is true that work had already started, particularly in laboratories concerned with commercial issue, but it was only when the League of Nations organization came forward to co-ordinate the work and introduce international methods and standards that any real progress took place. Not until 1926 was Magnus's standard for digitalis accepted. It may now be said that every biological substance for which it has been proved possible to find consistent methods of measurement has been provided with an international standard, and further standards will no doubt be adopted as technical methods of measurement improve and mature.

So far as therapeutics is concerned we may well believe that this new attitude will end the age of what might be called "private judgment" in therapeutics. If a therapeutic effect is consistent enough to be of value it should be measurable, and if measurable it should forthwith be measured, whether it be in the laboratory or in the wards. In biological standardization medical measurement has begun in good earnest, and the therapist can now say with confidence to the physicist or the chemist, "Our things may be more difficult to weigh than yours, but we weigh them no less conscientiously." Standardization technique is somewhat intricate both in measurement and in interpretation. The only way to make it understandable to the average reader is to give full detail, and this Professor Burn does without becoming obscure or dull; a little physiology is all that is needed in following even his more intricate experimental procedures.

In the interpretative part of the subject the great change which has come about in recent years has been due to the application of statistical methods. To this Professor Burn devotes three introductory chapters, which may be said to embrace a numerical philosophy of standardization. It would be a mistake for the ordinary medical man to look upon this subject as too technical and specialized to be of any interest to him. On the contrary, we believe that there is no better way of approaching rational therapeutics than by the study of the precise

methods of experiment and inference illustrated in biological standardization. The book deals with the measurement of hormones, vitamins, and certain drugs, and excludes immunological products. Immunological and non-immunological standardization make one intellectual discipline, but the experimental technique differs so greatly in the two branches that to have dealt with both would inevitably have meant composite authorship. Moreover, the more familiar physiological processes involved in non-immunological standardization make it easier for the non-specialized reader to follow. That a German version is already announced is evidence that this is a book that was widely needed and awaited.

ATLAS OF BACTERIOLOGY

Muir's Bacteriological Atlas. Second edition. Atlas enlarged and text rewritten by C. E. van Rooyen, M.D. (Pp. 90; 83 coloured plates. 15s. net.) Edinburgh: E. and S. Livingstone. 1937.

Richard Muir's bacteriological atlas must be well known to most bacteriologists and students of this subject; the appreciation of his artistry extended far beyond Edinburgh, where he worked. In the ten years since this atlas first appeared the microscopy of micro-organisms has extended beyond the cultivable bacteria to still smaller things—the so-called filterable viruses. At one time the viruses were held to be "ultramicroscopic," but it is now recognized that the larger ones come within the limits of visibility with the microscope; even the student is becoming familiar with their appearance. The publishers have deemed it time to bring this atlas up to date, and Dr. C. E. van Rooyen, the author of the new edition, has revised the text and extended the book by the addition of twenty-six coloured plates. Many of the new plates illustrate the morphology of viruses or the changes they produce in the cells which they infect, and, since Dr. van Rooyen's personal investigations have been largely concerned with the morphology of viruses, he is particularly well qualified for this task. And a glance at these plates, not only those depicting viruses but those also of other micro-organisms—bacteria, spirochaetes, and protozoa—shows that the author possesses considerable skill in the coloured reproduction of microscopical preparations; they stand comparison with Muir's, which is equivalent to saying that they are excellent. The text to Plate LVI on page 58 speaks of the nuclei being "deficient in nucleoplasm which . . . is arranged around the periphery of the cell in a marginated fashion." Surely this refers to chromatin, which is marginated at the periphery of the nucleus. And Plate LV, depicting the inclusions of herpes, is not above criticism, for the inclusions are more like Type B nuclear inclusions and do not show the margination of chromatin so characteristic of herpes inclusions. However, generally speaking, there is little to criticize in the new edition of the atlas, and Dr. van Rooyen is to be congratulated on the way he has done his work in bringing it up to date.

Notes on Books

Surgical Instruments and Appliances, which first appeared in 1905, was prepared—so the author, Mr. HAROLD BURROWS, informs us in his preface—to assist those upon whom the duty of making arrangements for a surgical operation fall. Such a book is likely to appeal also to students about to present themselves for examinations in surgery. On the whole the ninth edition may be said to be representative of the instruments and materials in current usage—orthopaedics, obstetrics, oto-rhino-laryngology, and ophthalmology are catered for as well as general surgery—but certain operations and instruments might well have been omitted or replaced. Perforators and burrs are more often used for opening the skull to-day than the trephine shown, and except for the very rare tumour arising in it the Gasserian ganglion is no longer removed. The use of a coin-catcher and probang (illustrated) with an oesophagoscope seems a little unusual, and page 73, depicting a crushing clamp and instruments used for haemorrhoids, might be taken from a pre-Listerian work. In future editions we hope to see this little book brought really up to date, because there can be no doubt about the need for such a compendium of surgical materials. The publishers are Faber and Faber, and the price is 2s. 6d.

A second edition of *A Surgeon's Pocket Book*, by Mr. H. S. SOUTTAR, has recently been published (Heinemann, 7s. 6d.). Into this volume of less than three hundred pages and of a size that will slip easily into a coat pocket without spoiling the shape of the coat has been compressed in tabloid form a review of the whole of surgery. To the Conjoint candidate who wants to acquire as many surgical facts as possible in the shortest time this little book will serve as the perfect *aide-mémoire*. The author has embellished this new edition with small reproductions of the plates in the new edition of his *Art of Surgery*. The student who uses this pocket book as supplementary to the larger work cannot fail to acquire a comprehensive knowledge of general surgery.

In his monograph *Las Miocarditis* (Buenos Aires: El Ateno) Professor G. N. MARTINEZ gives a comprehensive review of the clinical and pathological aspects of myocarditis, but does not appear to put forward any new ideas or report any original work. Many photomicrographs and electrocardiograms are used as illustrations. In the section on the nosographic classification of myocarditis more space is given to that of typhoid fever than to those of scarlet fever and rheumatic fever combined, and diphtheritic myocarditis is also rather briefly treated. Such an allocation seems disproportionate to the relative importance of the several types. No attempt is made to present modern work on a problem which is of paramount importance in Europe and North America—namely, the pathogenesis of rheumatic and scarlatinal myocarditis and their relation to streptococcal infection. Diagnosis, prognosis, and treatment are discussed with the utmost brevity.

In *Disease and the Man* (Oxford University Press, 8s. 6d.) Dr. R. F. LAPHAM aims at helping the recently qualified man, who is leaving the well-charted hospital wards for the open seas of practice, where he will encounter entirely different problems. This book is yet another sign of the revolt of the clinician against what he regards as the excessive inroads of the laboratory into his province. "With the ever-increasing delicacy and number of analytical procedures . . . attention shifted . . . and with this shift the patient paled into relatively less and less significance . . . [he] became resolved into isolated and impersonal segments." If the immense gifts that science has bestowed on medicine are fully recognized, protests such as these are not without their use at the present time. They help to keep the balance true. The author reveals himself as full of kindly common sense, but he leaves us with the impression that the American student must be decidedly less sophisticated than his English cousin.

A brief memoir of the late Dr. Cécile Booysen has just been published under the initials F. LeG. C., and copies can be obtained on application to the Secretary of the Medical Peace Campaign, 12, Kent Terrace, Park Road, London, N.W.1, price 6d., post free. A photograph of Dr. Booysen appears as a frontispiece to the memoir.

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THE IMMUNITY OF LONDON

At a time when public attention has been focused upon the typhoid outbreak at Croydon, which is just over the London border, it is refreshing to turn to the newly published report of the London County Council for 1936 concerning the public health.[1] The report shows in tabular form the comparative immunity which the metropolis has enjoyed for many years from fevers of the enteric group. During 1936 only 255 cases were notified, although this was an increase upon the figure (187) for 1935, and the deaths numbered thirty-one, together with seven others not actually occurring in London, though they were London cases. During the 'nineties the annual mortality in London from typhoid was round about 0.14 per 1,000 living. During the first quinquennium of the present century the rate fell to 0.08, during the second quinquennium to 0.04, and the fall was progressive until 1923, when the figure stood at 0.01, at which it has since remained. The notifications during the last decade of the nineteenth century were about 0.80 per 1,000 living; with the turn of the century they showed a progressive decrease, uninterrupted by the war, and by 1922 the figure was down to 0.06, around which it has remained, except in 1928, when it jumped to 0.13. In that year 580 notifications were made, but the number has been much less in subsequent years, and the lowest figure (109) was reached in 1934. In the late summer of 1936, 154 cases of typhoid were notified in London during a period of nine weeks. Of these, thirteen occurred among a party of girl guides from the Rotherhithe district who had been staying at a holiday resort on the south coast, and thirty-four of the cases were infected during the outbreak in the Bournemouth area, where the infection was attributed to an unpasteurized milk supply. The seasonal incidence of the London cases, as shown by notifications, was greatest in September and October and lowest in December and February. The cases seem to show no preference for any particular part of London, the notifications being greatest in Wandsworth in the south, Fulham in the west, Hampstead in the north, and Bermondsey in the east. The ages of the patients were under 5 years in twenty-nine cases; between 5 years and 20 years in ninety-one, and between 20 and 35 years in seventy-seven. Of the deaths (fourteen males and seventeen females) only three were at an earlier age than 15.

The mortality from enteric fever has shown over the course of forty years the same characteristic declining curve as scarlet fever, although, of course, the number of cases bears no relation; there were forty times as many cases of scarlet fever in the metropolis as of enteric, but the mortality from scarlet fever at the beginning of the century was the same as enteric—namely, 0.14 per 1,000 living—and it is now 0.01, the same as enteric. All the infectious diseases in fact show a marked decline. No case of small-pox has occurred in London since the middle of 1934. Deaths from measles (584) were fewer than in the previous epidemic years—1934, 1932, and 1930. Deaths from whooping-cough were higher, being 278 as compared with 166 in 1935, but here again there was a fall as compared with earlier years. Deaths from scarlet fever numbered only forty-two and from diphtheria only 226. The report mentions 382 cases of food poisoning, with one death, during 1936. The majority were isolated cases, and possibly due to the idiosyncrasy of the victims. The foods incriminated were chiefly meat and fish. Three or four outbreaks were said to have been caused by food eaten at staff canteens.

Altogether the healthy condition of London is a matter of legitimate pride, and reflects the greatest credit on the health services and on the medical profession in general. It must be remembered that in the area administered by the L.C.C. and the City Corporation we have a population of over four million persons, of whom one-fifth are under fifteen years of age. They live in three-quarters of a million houses, and one-third of a million people live under overcrowded conditions. Furthermore, London is the port of call for all manner of persons coming from all manner of places. It is constantly the scene of a migratory movement; every year, to judge by the last intra-censual figures, nearly 10,000 persons who have been born elsewhere settle in the metropolis—a figure much smaller, by the way, than in years gone by. Yet London keeps resolutely healthy and free from infectious diseases. A cause of mortality which is becoming formidable in the statistics is one which it hardly comes within the sphere of the medical officer to avert. Deaths from street accidents (541 in 1936) exceeded the deaths from influenza and equalled those from diphtheria, whooping-cough, and scarlet fever combined.

[1] *Annual Report of the London County Council, 1936.* Vol. iii (Part I). Public Health. P. S. King and Son, Ltd. 1937. (1s.)

MATERNAL MORTALITY IN THE U.S.A.

The secretary to the Bureau of Medical Information of the New York Academy of Medicine has assembled, in a handy volume,[1] the result of a number of investigations into the problem of maternal mortality which have been carried out in the United States during the last ten years. One of the most important of these investigations was that undertaken by the New York Academy of Medicine itself, and was the subject of an editorial notice in these columns on March 24, 1934. The inquiry dealt only with the City of New York, covering the three-year period 1930 to 1932; others came from the City of Philadelphia and from fifteen States selected from the Registration Area of the Republic. The greater part of Dr. Galdston's report is devoted to a statement of the facts elicited, and they are presented in clear and simple diction which is singularly free from what might be called obstetric jargon. Avowedly the author's public is the whole people of the United States, and he hopes at once to interest them in the problem and to demonstrate its salient features. His main thesis is that the reduction of their high maternal death rates can only be achieved if the medical profession secures the willing and informed co-operation of the general public, and, in particular, of the average American mother.

Dr. Galdston's survey of the conclusions to be drawn from the above-mentioned investigations is lightened here and there by cogent reflections of his own. In speaking of the "preventability" of maternal deaths he points out that deaths are classed as "preventable if they had had proper treatment and care." Behind "if," says the author, stand all those variants of professional competence in judgment and performance, of professional honour, and of good sense which render all human performances variable and unpredictable. It is essential that these considerations should be known to, and understood by, the public, and kept in mind whenever judgment is passed upon a particular case. The desirable attendant in a confinement, he says, is a "physician adequately trained and experienced in obstetrics . . . and aware of his limitations." This point has been made by others, although not perhaps so trenchantly expressed, yet it must not be forgotten that awareness of our limitations is learned by most of us in the painful school of failure, and, even so, it is learned more slowly by some than by others.

The components of the problem of maternal mortality in the United States are not identical with our own, and admittedly American difficulties are greater in extent than ours even where they correspond. It would therefore be unneighbourly to set up comparisons which on balance would incline in our favour. The principal points emphasized are familiar enough—namely, that large numbers of women receive no ante-natal care whatever; that the "vast majority" are ignorant of, and therefore indifferent to, abnormal conditions which may arise in pregnancy; that a small number of urban dwellers appear to suffer from an exaggerated fear of the sufferings and dangers of childbirth; that there is far too much "meddlesome midwifery"; and that maternity departments of hospitals are too often inadequately staffed and equipped. Dr. Galdston's view is that these defects can be repaired only by a concerted effort of nation-wide extent, in which individuals, groups, and committees must co-operate. Men and women alike must first learn what constitutes good obstetric service; then they will demand it, and demand will create supply. Among the first lessons to be learned by the general public is the fact that "operative delivery undertaken merely to alleviate pain and shorten labour involves increased danger for both mother and baby." It is recognized that the education of the public will call for a sustained campaign, not initiated by a few zealous individuals but organized and applied by the community itself. The process of education should begin in senior schools, where in courses of biology the requirements for safe childbirth could be included as part of the reproductive process. Secondary schools and universities, clubs and welfare societies should carry on the work, and so young men and women when contemplating a family would have a clear idea of the general lines upon which safe delivery may be sought, and would be in a position to exercise a wise choice of hospital or of medical attendant. It is of course recognized that when the public demands better obstetric service the doctors will be expected to supply that service. Among the first steps which should be taken by the medical profession Dr. Galdston puts the provision of adequate facilities for postgraduate study of midwifery, the certification of obstetric specialists by an "empowered body," and the recognition by the average practitioner of his obligation to refer all abnormal cases to specialists wherever they are available. Further, all hospitals should be "listed," and only those which are adequately staffed and equipped should be recognized as suitable for the reception of maternity cases.

If Dr. Galdston's survey is instrumental in stirring the great American public to action along the lines indicated there can be little doubt that in due time their problems will be solved; but it is a long, long trail that they are invited to follow.

[1] *Maternal Deaths—The Ways to Prevention.* By Iago Galdston, M.D. New York: The Commonwealth Fund. London: Oxford University Press. (15s.)

DOMINION GRADUATES AT OXFORD

Lord Nuffield, whose gifts to the University of Oxford during the past two years have amounted to just upon three and a half million pounds, has made a further allocation for the special benefit of medical graduates from the Dominions. He has placed at the disposal of the trustees appointed under his benefaction of October, 1936, when he set aside two million pounds for the purpose of the Medical School, a sum of approximately £168,000 in order that graduate students from South Africa, Australia, and New Zealand may have facilities for sharing in the advantages of the developments which are taking place at Oxford. During recent visits to the Dominions—he is now proceeding on another visit to Australia, to attend the 150th anniversary celebrations at Sydney—Lord Nuffield has been impressed by the flourishing condition of the medical schools despite their remoteness from the great centres of research, and it has seemed to him that a scheme which made freer access to Oxford possible for selected graduate students would encourage deserving work and be advantageous both to the Dominions concerned and to Oxford itself. He has therefore offered to establish in Oxford three demonstratorships, to be held in turn in the departments of anatomy, biochemistry, pathology, pharmacology, and physiology, and three assistantships in the departments of medicine, surgery, obstetrics and gynaecology, anaesthetics, orthopaedic surgery, and therapeutics. These posts will be tenable for a fixed period by graduates eligible for or already holding similar positions in those universities of South Africa, Australia, and New Zealand which grant medical degrees. The holders will be selected in rotation by the oversea universities. Payment of a sum for apparatus and incidental expenses will be made to the Oxford departments in which the visiting demonstrators and assistants work. The scheme also contemplates the appointment from time to time by Oxford University of a visiting professor to tour the Dominions for the purpose of giving information with regard to research in the home country and at the same time studying oversea needs. Lord Nuffield's gifts are of such magnitude that public attention is apt to be drawn to their scale, and the vision which inspires them is overlooked. In this latest gift, to provide facilities for Empire students, the benefactor reveals again his appreciation of a need not previously met and perhaps forecasts a scheme of study-visits and interchange on much bigger lines than this allocation can immediately bring about.

To the British Medical Association, which, especially during recent years, through its assemblies over-seas, its appointment of delegates on various occasions in the Dominions, its fostering care of Oversea Branches, and the constant work of its Dominions Committee, has done much to establish contacts and to secure for the medical profession in the Dominions a like position to that which has been established in the home country, this scheme will be specially welcome. It means far more than the creation of a few temporary appointments at Oxford. The Dominions themselves will benefit from the experience of these graduates on their return, and the spirit and technique of medical research and education as carried out under the most authoritative auspices will permeate the medical schools in the newer lands. As everybody knows, some very noteworthy contributions to medicine have come from the Dominions, but the relative isolation of the universities there has imposed a necessary handicap and has made certain inequalities inevitable. A reciprocal advantage will be that the University of Oxford itself, in its Nuffield School, will benefit by the presence of highly qualified workers, who will bring to the laboratories and wards the freshness of outlook and impatience of convention which one associates with our kinsmen from other parts of the Empire. The Oxford medical school will never forget that one of its most distinguished regius professors, Sir William Osler, came from over-seas.

A WEEKLY EPIDEMIOLOGICAL SURVEY

To give readers some idea of the extent and prevalence of notifiable diseases we print this week at page 52 a table under the heading "Epidemiology and Vital Statistics," and intend to include this from now onwards as a regular feature of the *Journal*. We shall supplement this when occasion demands with brief comments on any significant feature of the table and on any matter that is of current epidemiological importance. The table is compiled from the Registrar-General's weekly returns and from similar returns that have been made available to us through the courtesy and co-operation of the Departments of Health of the Irish Free State, Northern Ireland, and Scotland: to them we are much indebted. It should be made clear that the figures in this table do not apply to the week immediately preceding the issue of the *Journal* in which they appear but to the penultimate week—the latest period for which the information is available for publication in these columns. Attention is also drawn to the fact that the figures for the deaths under the heading of each infectious disease are for a certain number of towns in each area, while the figures for the notifications are for the whole area in each case. This is made clear in the legend at the head of the table. It will be noticed that median values can at present be obtained only for a limited number of notifiable diseases in this country and in London. It would have been a simple matter to give a list of

averages for the previous nine-year period, but the picture presented by these figures would have given readers a false impression of the actual situation. Mere lists of figures, although invaluable in directing attention to the occurrence and prevalence of particular diseases in different areas, give no information about the circumstances in which an outbreak has originated; nor do they reveal the steps which have been taken to control it or the measure of success which has attended them. In the comments at the end of the table we hope to give this information when it is available and when it seems relevant. We would therefore take this opportunity of seeking once more the co-operation of medical officers of health in keeping the medical profession fully informed on epidemic matters. A public health authority, especially that of a health resort, may be faced with an apparent conflict of interests in disclosing information regarding the occurrence of infectious disease in its area, particularly during the holiday season. As a matter of experience outbreaks of infectious diseases rarely arise through the direct fault of local authorities, but should any attempt be made to conceal its presence or gravity, or should there be delay in applying appropriate measures for its control, blame may be attached to those responsible. The policy of administrative candour is bound to pay in the long run. The recent application of the Public Health Act, 1936, makes the present time an opportune one for initiating this weekly survey.

THE CEREBROSPINAL FLUID

Drs. Houston Merritt and Fremont-Smith have already contributed a valuable article on the cerebrospinal fluid to *Nelson's Loose Leaf System of Medicine*, as well as numerous short articles on the same subject. They now give us at greater length the data from which they have formed their opinions.[1] These are taken from the records of the Boston City Hospital, and comprise personal examinations of 21,000 specimens of cerebrospinal fluid taken from patients suffering not only from disease of the nervous system but from many other conditions in which involvement of the nervous system was suspected. Although this wealth of material has not included every known disease which produces alterations in the fluid, it leaves few gaps and gives authority to the statements made. The authors are firm supporters of the "dialysate" theory of the formation of the fluid, though they confess that it is not possible to explain all the phenomena of its composition and formation by this theory. Of its absorption they say disappointingly little, and leave many questions related to hydrocephalus and increased intracranial tension unsolved. The monograph is, however, intended to be practical rather than theoretical, and when viewed in this light leaves little to be desired. Their full survey of the changes in the fluid found in many forms of nervous disease, and the diagnostic implications of the various fluid syndromes, should be valuable to practitioner and pathologist alike.

[1] *The Cerebrospinal Fluid*. By H. Houston Merritt, M.D., and Frank Fremont-Smith, M.D. W. B. Saunders Company. (22s. 6d.)

INDUSTRIAL DERMATITIS

Dermatitis as an industrial disease has developed into an important subject during the last few years. First cited as a ground for workmen's compensation in 1916 owing to the large number of cases arising in the course of munition work, it has since been reported with increasing frequency. As is well known, it is closely related to eczema, and the practical question continually arises whether a patient suffering from an inflammatory condition of the skin is to be considered as a victim of industrial dermatitis, and therefore entitled to compensation from his employer, or of eczema of constitutional origin. The importance of the subject is shown by the fact that not less than 15,000 cases of dermatitis are certified by factory surgeons every year. Dr. MacCormac, in a discussion on the subject at the annual meeting of the British Association of Dermatology, pointed out that the age incidence of idiopathic eczema and of industrial dermatitis, especially in males, is very much the same. He concludes that large numbers of cases of alleged occupational dermatitis are probably idiopathic eczema, though he admits that they may be examples of idiopathic eczema prematurely induced by the occupation of the patient but maintained by the constitutional peculiarity which determines eczema. This is rather a fine distinction and does not alter the legal liability of the employer to pay compensation in such cases. Quite commonly, when the disease first shows itself, the employer agrees to pay compensation, but a legal battle may take place when the employer makes an application to end the compensation on the ground that the workman is no longer suffering from industrial dermatitis. Some medical men are inclined to hold the view that a dermatitis due to work cannot persist for a long period after the removal of the alleged irritant, and that when it appears to do so the patient is really suffering from idiopathic eczema. If this view were accepted by the courts the workman's compensation would be stopped, but, very properly, judges are extremely reluctant to take up this attitude, and they are supported by another body of medical opinion, which holds that the human skin which has once been attacked by occupational dermatitis may acquire a habit of breaking down, and of becoming sensitive to agents and influences which were previously harmless. The beginning of all cases of occupational dermatitis is the certifying factory surgeon's certificate to the effect that the patient is suffering from this condition. This throws the liability of compensating the suffering workman on his employer or his representatives. Although in the vast majority of cases the certificate is correct, it must be remembered that factory surgeons are not often dermatologists, and hence cases occasionally arise in which other skin troubles—for example, lichen planus, psoriasis, or even scabies—are certified as occupational dermatitis. By the regulations governing the procedure under the various Workmen's Compensation Acts any appeal against the factory surgeon's certificate must be entered within ten days, and if this is not done the certificate becomes binding. In this way workmen occasionally draw compensation

which they really do not deserve, but such cases are very infrequent. On the whole the Act carries out the intentions of the legislature satisfactorily. Many modern industrial processes entail serious risk of damaging the skin of the workman, and, although cases of industrial skin disease form only a small percentage of the accidents and diseases to which workmen are liable in the course of their employment and for which it has been rightly decided that they should be compensated, the actual number of skin cases is, as we noted above, by no means inconsiderable. It must be remembered not only that there are many branches of manufacture in which the skin is exposed to various sorts of liquids and dusts which are notorious for their liability to damage the skin, but that most manual labour is carried on under rough and dirty conditions which are likely to be detrimental to any skin insufficiently endowed with toughness. The number of cases reported has much increased during recent years. This is not due to any deterioration in conditions of work, but is because the approved societies have woken up to the opportunity open to them of getting rid of their liabilities to their members in respect of skin disease. At the present time, whenever a workman goes sick with any form of skin disease his approved society is extremely likely to attempt to show that it is a case of industrial or occupational dermatitis. Most of these cases are settled on reports from the medical men who advise the insurance companies which relieve the employers of their statutory liability, and the number of cases which ultimately find their way before a legal tribunal is very small. On the whole, though occasionally abused, the law providing for compensation in cases of industrial dermatitis works well and protects the interests of the worker in a just and satisfactory manner.

CO-OPERATION BETWEEN PHYSICIAN, SURGEON, AND DENTIST

From the Editor of the *Military Surgeon* we have received a reprint of a paper on the interrelation of medicine, surgery, and dentistry in military and civil practice read by Captain W. S. Bainbridge of the U.S. Naval Reserve Medical Corps-Fleet. He urges closer co-operation between physician, surgeon, and dentist, and supports his argument by interesting and pertinent cases met with in his own practice, and by observations from outside it. Hippocrates 2,500 years ago cured a patient of rheumatism by removal of a diseased tooth. In the world war bone wounds among Mohammedan regiments healed badly till orange sticks were substituted for tooth-brushes—unused on account of a possible pig-bristle. In Captain Bainbridge's practice contact between dissimilar metal fillings has been found capable of causing lesions of cheek or tongue suspicious of malignancy; the lesions were cured by insertion of similar metal fillings; and mastitis has been found definitely dependent on dental sepsis. Reading the detailed clinical cases gives us the impression that actinomycosis of the mouth is far commoner in the United States than in this country. The author most certainly proves his thesis.

THE TRUDEAU FOUNDATION

To those familiar with the development of the sanatorium movement the name Trudeau probably conjures up the picture of a young married man with advanced pulmonary tuberculosis, almost given up by his physicians, trudging along the Adirondack Mountains, an isolated spot in North America, in the hope that the open-air life would work a miracle. That was over fifty years ago; and the miracle happened. To most people, however, the name Trudeau brings to mind the Trudeau Foundation at Saranac Lake, with its modern sanatorium of 185 beds and laboratory, also a special research laboratory and medical school for tuberculosis, which were established in 1916 to Trudeau's memory—all at the spot to which he came to regain his health. It is now over twenty years since Edward Livingstone Trudeau died, but the yearly reports of the Trudeau Foundation continue to bring before us the results of his work and vision. The sanatorium caters for "self-supporting" people; the Trudeau School of Tuberculosis gives courses of instruction to physicians, and by awarding fellowships for study and research provides support for young physicians and scientists undergoing treatment. There is a clinical research laboratory at the sanatorium, and, in addition, in the village of Saranac Lake, there is the Saranac Laboratory for the study of tuberculosis, formerly the private laboratory of Dr. Trudeau, which, though co-operating with the sanatorium laboratory, is a separate concern. It serves as headquarters of the Trudeau School of Tuberculosis, provides diagnostic facilities for the physicians practising in the village, and carries out independent researches in the field of tuberculosis and associated conditions. The annual report for 1936,[1] consisting of three pamphlets, has just reached us. The general report, which is concerned chiefly with financial details, is of less interest to clinicians than the medical one. Some of the results published in the latter are worthy of note. During the year 264 patients were discharged (including three deaths), but sixteen of these were either non-tuberculous or only suspected of having tuberculosis. "Only sixteen, or 6.5 per cent., of the remaining 248 were discharged as having their disease 'arrested,' and twelve, or 5 per cent., as 'apparently arrested,'" the report stating that "the few months' residence for most patients is insufficient for complete arrest." This comment must be amplified by giving some further figures. Of the thirty-eight patients who stayed from thirty to ninety days (average sixty-two days) 23.7 per cent. were discharged as "quiescent"; of 187 patients who stayed ninety days or over (average 299 days) 15 per cent. were discharged as "arrested" or "apparently arrested," and 50.2 per cent. as "quiescent." Among these 187 people no less than 63.6 per cent. were classified as "moderately advanced" and 12.3 per cent. as "far advanced" on admission. While the report does not indicate how far the terms used at Saranac Lake are comparable with those in this country, the results would appear to be better than those obtained in sanatoria of a similar type here.

[1] Report of the Trudeau Foundation for the year ending September 30, 1936.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

THE TREATMENT OF BURNS AND SCALDS

BY

PHILIP H. MITCHINER, M.D., M.S., F.R.C.S.

In dealing with the treatment of burns and scalds in general practice one of the most important things to realize is the far better prognosis which can be given in the case of scalds than in the case of burns. For whatever the treatment used, it is a well-established fact that the mortality rate in scalds is only one-third of that from burns, and therefore in any scald a correspondingly better prognosis can be given than in a burn of the same extent.

Why do Burnt Patients Die?

One of the first things to remember is the importance of prophylaxis, and in order to apply this effectively it is necessary to understand the causes which result in the death of the patient. It has been established that 80 per cent. of the deaths ensue from shock and collapse, which are due partly to the absorption of histamine and other toxic bodies from the damaged tissues, partly to the excessive loss of fluid from these tissues, and, lastly, to the pain from the exposure and stimulation of nerve endings. The remaining 20 per cent. mostly result from sepsis, and occur not within the first two days as in the case of the collapse, but in about a week or ten days from the infliction of the burn.

Discussion of the researches which have led to these findings is out of place in such an article as this, but those who wish to inform themselves of the details are referred to the many works on the subject. It will be seen from the above that for any treatment to be efficient it must be directed primarily to the avoidance of collapse and must aim essentially at the complete coagulation of *all* damaged tissues in order to prevent the absorption of toxins, the escape of fluids, and excessive pain. Secondly, thorough cleansing of the damaged area and its surroundings is necessary if sepsis is to be avoided. By the thorough application of these two principles, coagulation and cleansing, the modern treatment of burns has been able to show such a great advance that the mortality from these injuries has dropped to one-tenth, as will be seen by the study of Table I.

TABLE I.—*Mortality of Burns and Scalds in St. Thomas's Hospital*

Year Groups	Treatment	Mortality (per cent.)	
		Burns	Scalds
1894–1898	Baths and ointment	39.6	18.8
1900–1903	2 per cent. picric	39.7	7.0
1924–1928	2 „ „ „	15.5	7.5
1929–1936	2 per cent. tannic	4.0	1.7

Coagulant

It is essential that to be efficient a coagulant should be able to penetrate while acting, so that the entire depth of damaged cells may be reached. There is otherwise a grave danger that a superficial coagulum (which still permits of absorption and escape of fluids from the deeper uncoagulated tissue) may lead to a sense of false security through having caused cessation of pain and a temporary improvement in the patient's condition—an improvement which is not maintained but is succeeded in a few hours by the advent of that "secondary collapse" so well described by Wilson of Edinburgh and so frequently fatal. It will be seen that the ideal coagulant not only should be capable of penetrating but it must be used in a solution weak enough to allow it time to penetrate into the depths of the damaged tissues. As the mortality table shows, the use of picric acid led to a fall in mortality; this was due to its coagulant properties, but no greater fall occurred, because picric acid coagulates only the superficial tissues. Tannic acid, on the other hand, if used in a sufficiently weak solution, is capable of penetrating through the entire depth of the damaged tissues, and therefore gives far better results than either picric acid, silver nitrate, or strong solutions of tannic acid, which produce only a superficial coagulum.

The older methods of treatment by ointments or paraffin-wax merely secured cessation of pain and in no way procured coagulation, so they will be mentioned merely to be condemned. Similarly the modern method of treatment by crude cod-liver oil preparations offers in its results no comparison with those obtained by coagulation, though it has the advantage over the older greasy dressings that sepsis can be held largely in check. The gentian-violet treatment also aims at antisepsis, but it does not produce coagulation, so that the results are not satisfactory in severe burns, though considerable absorption of the dye occurs.

The Use of Tannic Acid

One important point in relation to tannic acid is to remember to use weak solutions. Personally I advocate a 2 per cent. strength—certainly never over 5 per cent. It must be borne in mind that tannic acid in solution readily grows a large selection of moulds and thus becomes very septic; so an antiseptic has usually to be added to prevent this. Various antiseptics have been tried, the most successful being perchloride of mercury 1 in 2,000. It has been found, however, that this solution decomposes in about two months, and in order to prevent this a powder is used which not only keeps indefinitely but dissolves easily in warm water. This consists of tannic acid, 17½ grains, and perchloride of mercury, 1/2 grain, to be dissolved in two ounces of warm water. This gives a 2 per cent. tannic acid solution with 1 in 2,000 perchloride of mercury; and the two ounces, in addition to being sufficient for each spraying, will soak a compress dressing 6 by 4 inches, which is large enough to cover the average burn met with in domestic practice. In the case of larger burns two or more powders, as may be necessary, can be dissolved in a corresponding quantity of water. As the perchloride, however, has the disadvantage of being scheduled as a poison, many other antiseptics have been tried, including acriflavine and hexyl-resorcinol, of which the latter in a 1 in 2,000 solution is the most beneficial. These, however, frequently cause pain to the patient and interfere with the formation of a hard and

satisfactory coagulum. *It cannot be too strongly impressed on the practitioner that the addition of this antiseptic is to preserve the tannic acid solution, and does not prevent sepsis in the area of the burn, which must therefore be most carefully cleansed,* as described later.

After these preliminary remarks I will proceed to consider in detail the treatment with tannic acid. This may be applied by either the compress or the spray, but inasmuch as the spray treatment is possible only in hospital it will not be described here: experience shows that it never gives good results in severe burns when applied under the conditions of private practice, and it is unnecessarily complicated in slight cases, where the compress or the application of tannafax jelly gives equally good results. In passing, it may be mentioned that tannafax jelly is an excellent method for treating small burns such as so frequently occur in homes, where it can with advantage be kept with the stock of first-aid applications. It does not, however, give satisfactory results in large or extensive burns. (A full description of the spray method can be found in *The Modern Treatment of Burns and Scalds.*)

First-aid Treatment

The treatment of burns, as of any injury, resolves itself into first-aid and final treatment. The first-aid treatment must be immediate, because the sooner a coagulant is applied the smaller is the likelihood of collapse. It may be argued that few homes keep tannic acid; but there are very few where tea is not procurable, and the infusion of tea as we drink it contains from 2 to 5 per cent. of tannin—a fact realized long ago by the Chinese, who have successfully dressed their burns with tea for over 5,000 years. All that is necessary, therefore, as a first-aid measure is to soak clean linen in tea and apply it promptly all over the burnt area. Care must be taken that the tea is sufficiently cooled, so that no scald is inflicted by its application.

Oils, flour, and butter must have no place in the first-aid treatment of burns, for, although they stop the pain, that is all they can do, and collapse, often fatal, will occur.

After the application of tea or tannic acid wrap the patient up well and give plenty of warm fluids to drink; an injection of morphine, 1/4 to 1/3 grain, or a dose of tincture of opium, according to the age of the patient, may be given with advantage, and this fact must be recorded. Do not hurry the patient into an ambulance and rush him to hospital; he will be very much better if he is left lying quiet for half an hour before being transferred.

Final Treatment

The final treatment consists in the *application of the tannic acid compress*; but first the burnt area and surrounding skin must be thoroughly cleansed, and this can be efficiently carried out only under anaesthesia. Burnt patients are liable to pulmonary complications, so that inhalation anaesthesia should be avoided; similarly there is a tendency towards albuminuria, with renal and hepatic inefficiency, and therefore barbiturates such as evipan or avertin are not without their risks. For these reasons heavy dosage with opium or morphine, as suggested in Table II, has been found most satisfactory to induce anaesthesia in these cases. In this respect it must be remembered that the drug will need at least half an hour to act before the patient is sufficiently somnolent to permit cleaning to be proceeded with.

TABLE II.—*Opium Dosage for Cleansing Burns and Scalds*

1.—IN CHILDREN

Age	Preparation	Dose
1 month	Tinct. camph. co.	℥ij-iij
2 months	„ „ „	℥iv-vj
3 „	Tinct. opii	℥½-¾
6 „	„ „	℥¾-1
1 year	Tinct. opii (*a*) or Inj. morph.	℥ij-iij grain 1/75
Over 1 year	Tinct. opii or Inj. morph.	℥ij for each year and ℥ij in 15 minutes if necessary grain 1/75 for each year

2.—IN ADULTS

Age	Preparation	Dose
12–15 years	Tinct. opii and Inj. morph.	℥xxx grain ¼
15–20	Tinct. opii and Inj. morph.	℥xxx grain ¼
Over 20 years	Tint. opii and Inj. morph. (*b*) or Inj. morph. (*c*)	℥xxx grain ¼-½ grain ½-¾

(*a*) Tinct. opii is more satisfactory than morphine. (*b*) For women. (*c*) For men according to stamina.

N.B.—Should slow or shallow breathing give rise to anxiety atropine sulphate 1/200 to 1/50 grain should be administered hypodermically.

Essential Cleansing

When the patient is well under the morphine the first-aid dressing is removed and the area of the burn and the skin round it are cleaned. It is the latter which is most likely to be septic, as it has not been properly burnt, so it must be cleaned with especial care. On this depends the entire success of the treatment with tannic acid, and I venture to say that *if your treatment fails it will be because the area has not been cleaned properly, and for no other reason whatsoever.* All dead skin must be removed, debris picked off, blisters pricked, the raised skin cut away, and the whole area washed with soap and warm water, using a flannel or sponge. When the area is thoroughly clean—particularly round the edges—it should be sponged with ether. The tannic acid dressing is then applied.

The Compress

Into the 2 per cent. tannic acid solution, made up as described, dip a dressing of three layers of sterile lint or six layers of sterile gauze, cut to extend three inches beyond the obvious edge of the burn. Take it out dripping, and apply loosely and evenly over the burnt area. Then bandage the dressing firmly into position and leave it to dry, with the area rendered immobile by skeleton splints or suitable fixation: this is perfectly simple, and keeps the patient warm. If the burnt area is large a cradle should be used, and extra heat must of course be applied to warm the patient; but do not let the heat be too strong or the compress will dry before the tannic acid has had time to penetrate and secondary shock will subsequently develop, as the deeper damaged tissues are not coagulated. An electric lamp a little way off, or a hot-water bottle held near the dressing, will be sufficient to dry the compress slowly, and, incidentally, will not concentrate the solution.

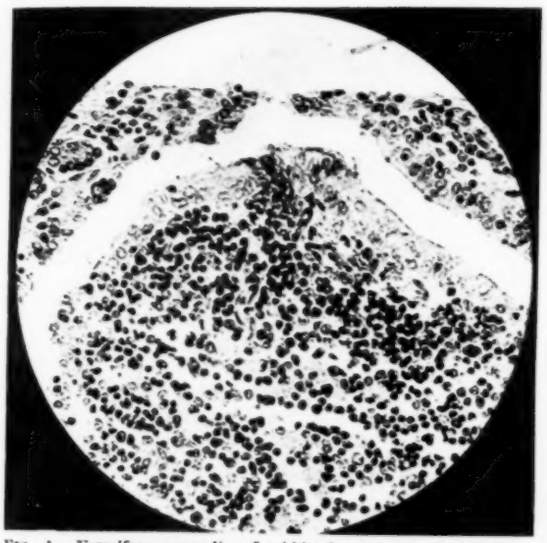


FIG. 1.—Vermiform appendix of rabbit (low power). Lymphocytes pouring into the alimentary canal.

FIG. 2.—Vermiform appendix of rabbit (high power). Lymphocytes pouring into the alimentary canal.

FIG. 3.—Vermiform appendix of rabbit. Lymphocytes in subserous lymphatics.

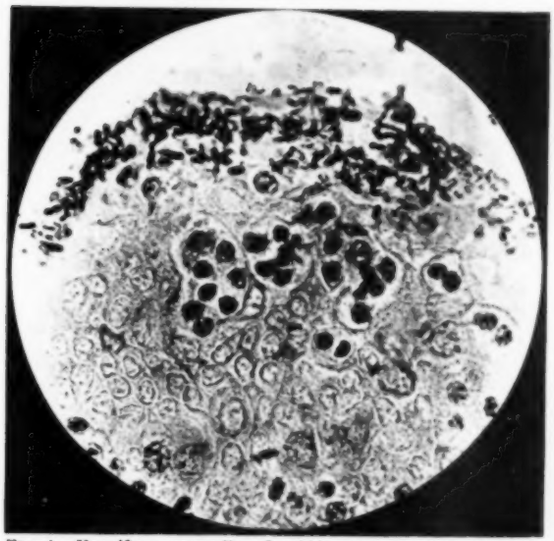


FIG. 4.—Vermiform appendix of rabbit. Groups of lymphocytes moving out to meet bacterial invasion.

FIG. 5.—Vermiform appendix of rabbit. Atrophy of lymphoid tissue as a result of vitamin A deficient diet.

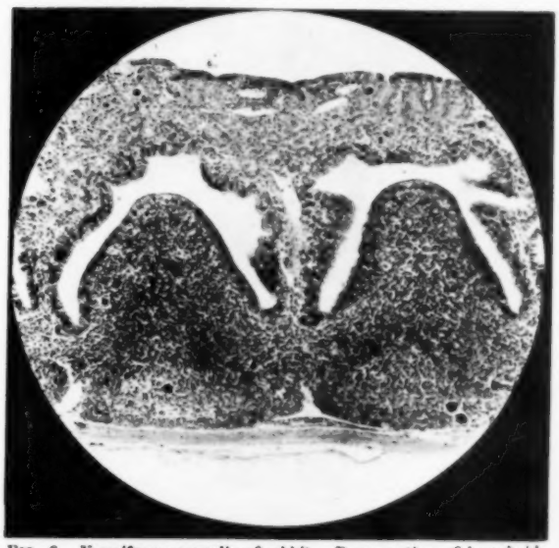


FIG. 6.—Vermiform appendix of rabbit. Regeneration of lymphoid tissue after giving provitamin A (carotene).

H. B. RODERICK: FRACTURE OF NECK OF FEMUR. ANOTHER METHOD OF INSERTING THE SMITH-PETERSEN PIN

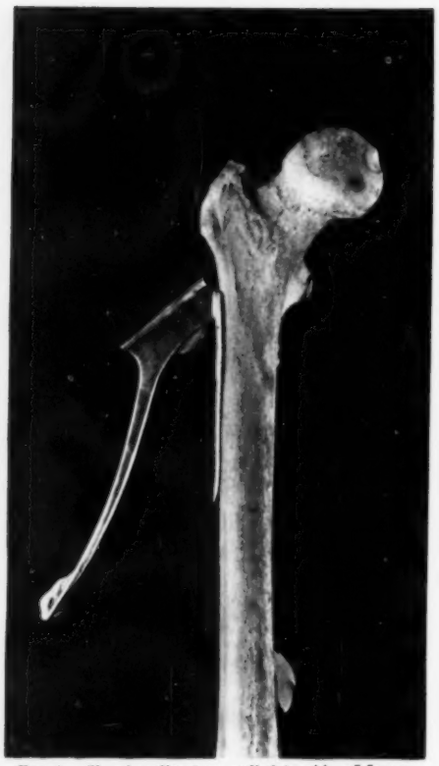


FIG. 1.—Showing director applied to side of femur.

FIG. 2.—Side view, showing director and forceps lying parallel to each other.

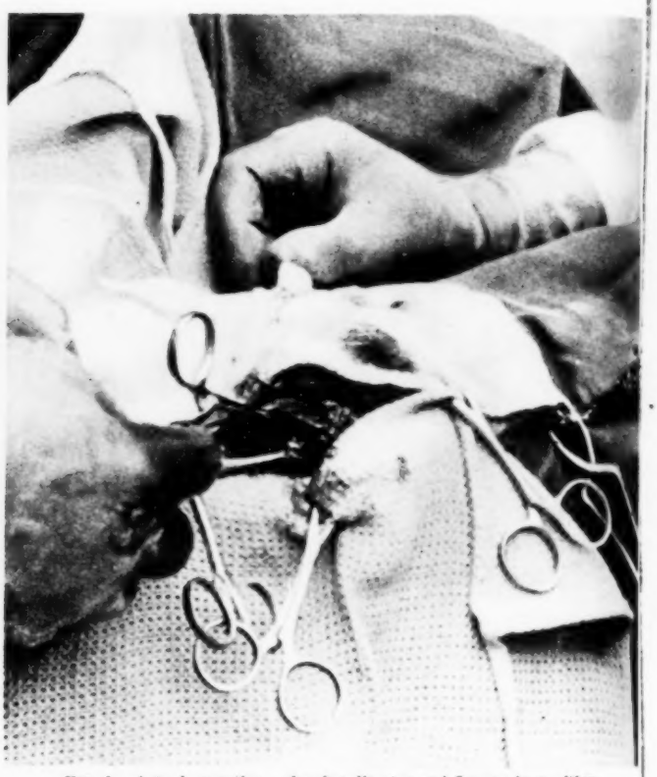


FIG. 3.—Actual operation; showing director and forceps in position.

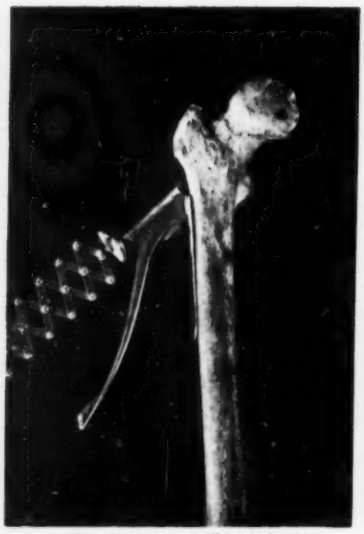


FIG. 4.—Kirschner wire drill laid along groove on upper edge of director.

FIG. 5.—Same as Fig. 4, at operation.

FIG. 6.—Guiding-wire in position.

H. B. RODERICK: FRACTURE OF NECK OF FEMUR. ANOTHER METHOD OF INSERTING THE SMITH-PETERSEN PIN

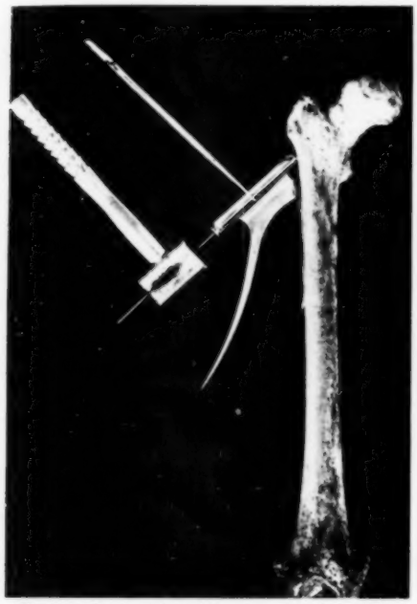


FIG. 7.—Showing pin and hammer threaded on to guiding-wire. Pin resting on director.

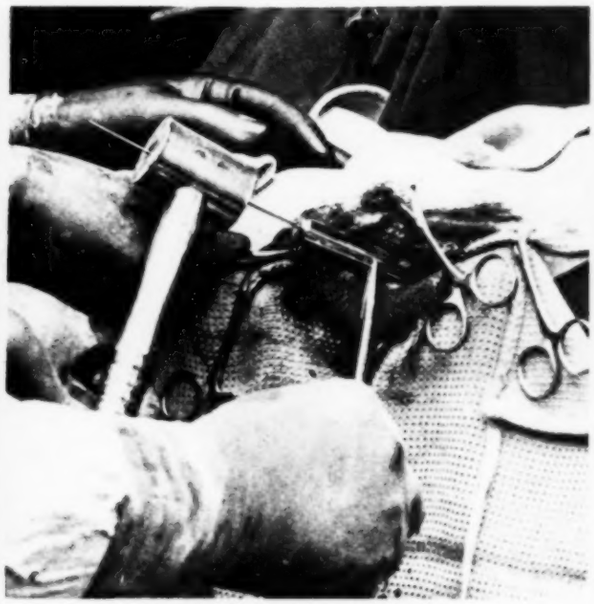


FIG. 8.—Same as Fig. 7, at operation.

FIG. 9.—Radiograph before reduction.

FIG. 10.—Radiograph showing deformity corrected and guiding-wire in position.

FIG. 11.—Radiograph showing pin in position.

F. A. H. SIMMONDS AND W. PAGEL: CHRONIC DISSEMINATED TUBERCULOSIS

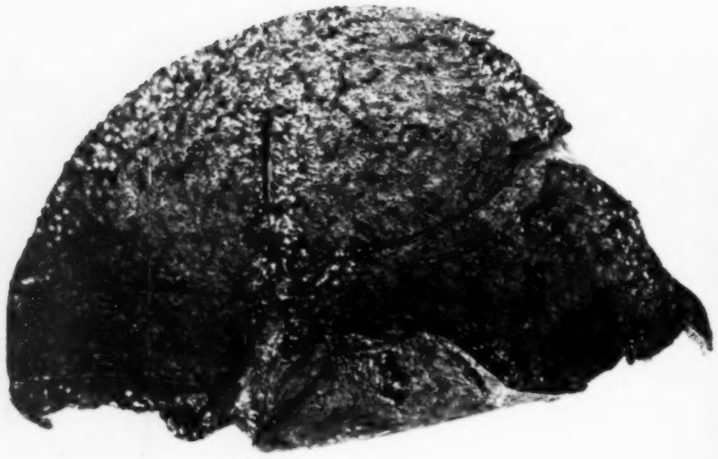


FIG. 1.—Miliary tubercles in cortical areas and along interlobar fissure.

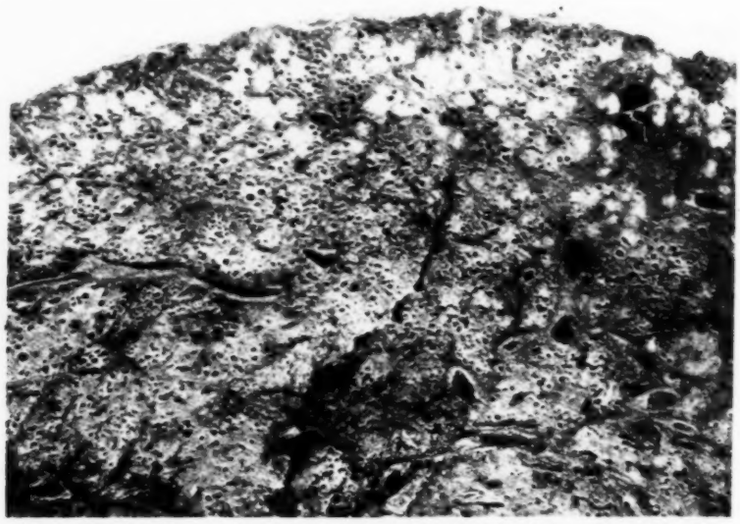
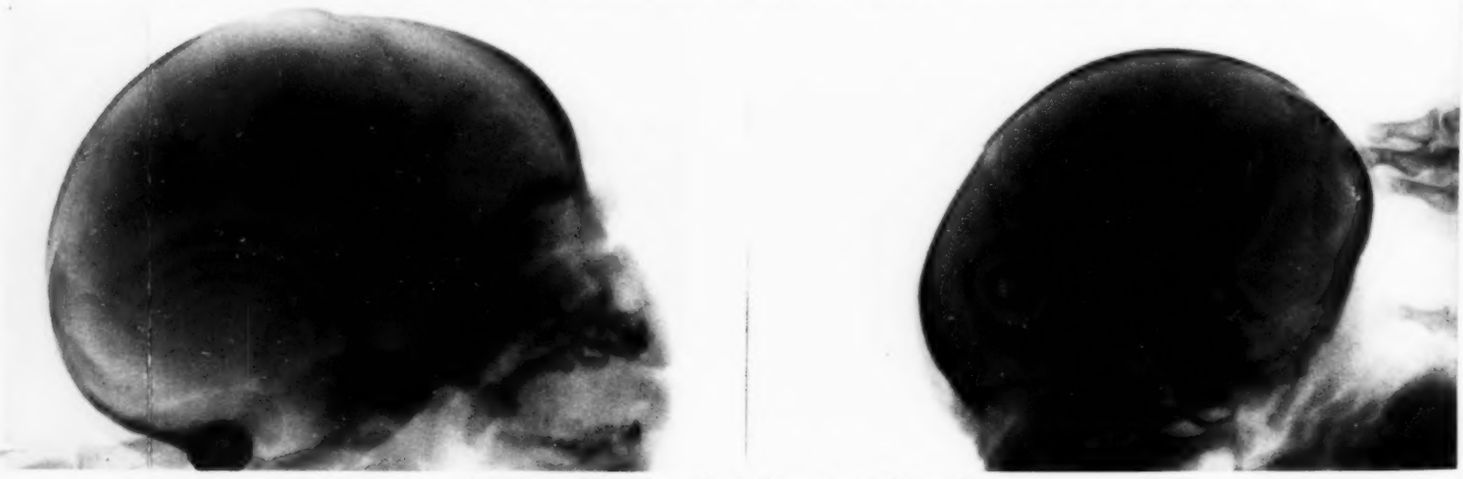


FIG. 2.—Miliary tubercles in cortical zone: small emphysematous bullae: pleural thickening and adhesions.

G. C. GORDON: PERSISTENT OVERMOULDING OF THE SKULL BONES CAUSING FITS IN AN INFANT



Radiographs showing the overlapping bones at age of 3 months.

J. M. TURNER: UNUSUAL CASE OF CHONDRIFICATION OF PATELLAR LIGAMENT

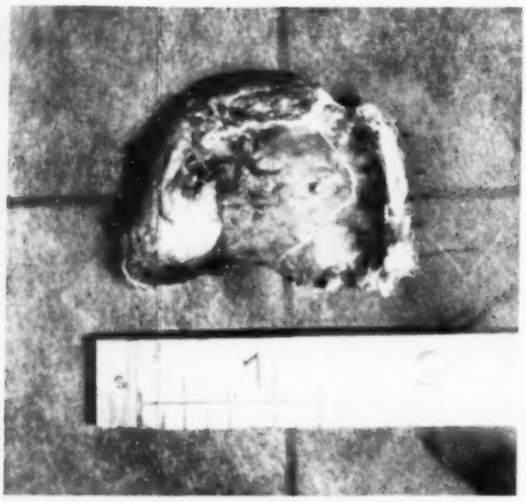


FIG. 1.—Photograph of the cartilaginous mass excised.

FIG. 2.—Lateral view of left knee-joint. Note (*a*) cartilaginous mass in the patellar ligament; (*b*) upward displacement of the patella.

After-treatment

The patient must be kept warm and fluid be given freely to combat collapse. The dressing should be left untouched for two weeks approximately, by which time the coagulum will separate naturally when the bandage is cut. Fixation of the burnt area must be maintained for the first twenty-four hours at least, so that the coagulum of tannic acid can solidify, and if the burn is in any of the flexures of the body the limb must be extended by splints, so as to avoid contraction and subsequent deformity from destroyed subcutaneous tissue or muscle. A burn extending all over the hand, for instance, would entail separating the fingers with rolls of bandage between the knuckles, so that they would not become webbed at the base and leave the hand deformed. In first or second degree burns these splints may be removed in forty-eight hours in most cases, but with deeper burns they must be retained till the coagulum separates, and often have to be reapplied for some time after this.

At the end of two weeks cut the bandages and the coagulum will lift away from the burn. Any areas that are inclined to stick should be left a day or two longer, when they too will come away neatly.

Complications

Various complications may occur during the course of treatment.

1. *Cracking of the coagulum* results unless efficient fixation is maintained for the first twenty-four or forty-eight hours, and is an indication that the dressing must be removed and the burnt area re-tanned with the part properly fixed. Similarly, if hexyl-resorcinol or acriflavine solution is used a soft and unsatisfactory coagulum may result, and this is also an indication for re-tanning.

2. *Sepsis* may occur, though in this respect it must be realized that the escape of a little serous or sanious discharge round the edges of the coagulum is of frequent occurrence and does not mean that sepsis is present. Pain, pyrexia, and a discharge of frank pus alone indicate sepsis; these call for the removal of the loosened coagulum, thorough re-cleansing of the area, and reapplication of a tannic compress, when a satisfactory result will be obtained.

3. In burns which have destroyed the skin *ulceration* will of course be present when the tannic acid coagulum separates. All that is necessary in these cases is continued splintage to prevent contracture and the application of a suitable lotion, or the use of some method of skin grafting to effect healing, which can be obtained with very little scarring.

Special Burns

Burns in certain situations, such as the face, perineum, and buttocks, are better treated, if possible, by the spray, though with care an excellent result can be obtained by the compress. In the case of a burnt hand great care must be taken in the application of compress and bandages to individual fingers and the clefts between them, as well as in the splinting of the hand and fingers and the fixation of the latter apart by means of rolls of bandage stitched between the digits well clear of the clefts.

Up till now only fire and water burns and scalds have been considered, but there are also many very bad *chemical burns*. Tannic acid is equally good for these, but the chemical that has inflicted the burn must first be neutralized completely before the tannic acid is applied. In any such burn washing freely with a large quantity of warm water is essential, and in addition an *acid burn* must be neutralized with an alkali—bicarbonate of soda, for instance—while an *alkali burn* should be neutralized with a 2 per cent. citric acid solution; this is best, as it penetrates the tissues, while most of the other acids (for example, acetic) act only on the surface.

Electrical burns are very difficult indeed to treat. They are often fatal, and so the need for treatment does not arise. Only a very small burn shows—a sort of stab in the flesh where the current has entered. The patient should be moved away from the current at once—even before it is switched off; but of course the rescuer must take the greatest care not to become electrocuted himself. The patient must be treated for collapse and the small burn with tannic acid, but very little else can be done. Pain will be intense through all the nerves. A certain amount of relief can be obtained from the use of veronal tablets, but morphine must on no account be given.

In the case of burns from *mustard gas* the medical man must protect himself by using rubber gloves and, of course, by wearing an overall and respirator. The first thing to do is to neutralize the gas with bleaching powder emulsion, then wash the area with plenty of water, dry over with ether, and put on a tannic acid compress.

For *lime or gas burns* in the eyes irrigate the eyes first with a neutral fluid such as a 2 per cent. solution of citric acid, and then instil sterile castor oil and a drop of 1 per cent. atropine solution.

Lastly I will just mention *sunburn*, which, after all, is a burn and often requires specific treatment. The popular idea of treating sunburn is to put on grease and lie out in the sunshine. Of course as a result the patient is very nicely basted, and suffers all the pain of a fire burn. Here is a prescription which has been found very beneficial when dealing extensively with sunburn at Territorial camps:

℞	Calamine	400 grains
	Zinc oxide	400 „
	Tannic acid	100 „
	Glycerin	1 ounce
	Water	1 pint

This lotion should be applied at hourly intervals until the irritation is relieved. Incidentally the lotion has itself a pleasant tanning effect on the skin.

Other Methods of Burn Treatment

Many other methods have recently been used, but the majority fail in that they do not produce coagulation; considerable shock therefore ensues from the escape of fluid, and in severe burns this frequently has fatal results. Thus they cannot in the majority of cases be considered as efficient as a weak solution of tannic acid.

Crude cod-liver oil has had a considerable vogue, but is no better than any other grease dressing, though, as stated, it holds sepsis largely in check.

Gentian violet (1 per cent. aqueous solution) is an excellent antiseptic and keeps burns clean. No better treatment can be used for small first and second degree burns. It must be realized that absorption takes place in all burns, and the urine may be discoloured, while there is of course a violet discoloration of the skin, which persists for a considerable time. Moreover, as no coagulation of the damaged tissues occurs shock will result from loss of fluid. This antiseptic unfortunately does not combine well with tannic acid.

Silver Nitrate.—A 10 to 20 per cent. solution of silver nitrate rubbed into the burnt area produces a tough and rapid coagulum; but here again it does not always penetrate into the deeper tissues, and so a certain amount of collapse occurs in severe burns. Next to tannic acid, however, an application of silver nitrate and gentian violet gives the best results; but here once more the primary essential cleansing of the burn and surrounding area is necessary if sepsis is to be prevented. The patient having been given a dose of sedative, and the area of the burn being cleansed as already described under the tannic acid treatment, the whole of the burn area is painted or sprayed once with a 1 per cent. aqueous solution of gentian violet and is thoroughly swabbed over with a 10 to 15 per cent. solution of silver nitrate, care being taken that the silver nitrate does not escape over the surrounding skin. The area is now again sprayed or painted with a 10 per cent. solution of gentian violet at fifteen-minute intervals for five or six times, the patient in the meantime being kept warm under an electric cradle and given plenty of fluids to drink. Should it be necessary the painting or spraying with gentian violet can be repeated once or twice daily for the next day or two. From the use of this method the American authorities report a mortality of 7.3 per cent., apparently for both burns and scalds; this is considerably higher than that from weak tannic acid solution, as might be expected when one realizes that in the case of extensive burns the silver nitrate coagulum does not extend into the deeper damaged tissues.

Many other antiseptics have been combined with tannic acid instead of perchloride, the most popular of which is acriflavine. This substance, however, in my experience, is not satisfactory for the reasons already given. The same objections apply to the great majority of antiseptics that have been tried in this connexion.

Finally, I would say to those practitioners who bring forward instances where some particular treatment has given good results in individual cases of burns that any treatment may be successful in the case of a slight burn, but that in severe burns cleansing and coagulation alone can be relied on to preserve the patient's life, with the minimum of disfigurement and the maximum relief of pain and the prevention of collapse and sepsis.

CROYDON TYPHOID INQUIRY

EVIDENCE OF EXPERT WITNESSES

The tribunal inquiring into the outbreak of typhoid fever in Croydon continued its sittings over Christmas. The first evidence called on behalf of the Corporation was that of a geological expert, who spoke as to the structure of a gathering ground of the suspected well, and a consulting water engineer, who testified as to the character of the water from the Addington supply. The latter witness, Mr. S. R. Rafferty, agreed that this well had been known for a number of years to show variations in the quality of the water. He agreed also as to the danger from workmen's latrines in the vicinity during such time as some work was proceeding on a school belonging to the local authority, and as to the undesirability of the presence of a pig farm at this particular spot, though he would not say that this was a possible source of danger. It was further put to this witness that on the other side of the wood from the reservoir there was a ground, just outside the Croydon boundary, which was used as a week-end camping place for some hundreds of people and had no sanitary conveniences of any kind. The witness replied that there had been no means of dealing with such a state of affairs, unless it could be held to constitute a local nuisance, until the passing of the recent Public Health Act.

Medical Officer of Health's Evidence

Dr. O. M. Holden, medical officer of health for Croydon, who was in the witness chair for three days, traced the history of the epidemic and of the inquiries set on foot regarding water, drains, etc., immediately the cases occurred. He had been under the impression that the whole of the Croydon water was chlorinated, and was surprised to hear that the high-level supply, which included that from the Addington reservoir, was not. Chlorination of the Addington well began on November 1. He had studied reports of a predecessor of his in 1905–8 regarding the liability of the Addington well to surface pollution. He knew the conditions on the gathering ground, and for some time he had been a little uneasy about this well; he had drawn attention to the fact that the analyses of the water from this well did not appear to be satisfactory and had recommended chlorination.

In reply to his own counsel, Mr. Sandilands, K.C., Dr. Holden said that the duties of the medical officer had been considerably increased during the last twenty years, but the water supply had never been put upon him. He did not wish to deny that as medical officer he had a certain responsibility. He considered the limit of his responsibility to be to advise the responsible authority on the bacteriological analyses, which were the only material he had before him. At the end of 1930 he advised that chlorination should be considered by the borough engineer, and he had been under the impression that chlorination was carried out at Addington well from that time. It was put to him by Mr. Lyons, counsel for the South Croydon Typhoid Outbreak Committeee, that in 1931 he had reported that some solid contamination had been getting into the Addington water, and that if the area were built on to any greater extent and cesspools multiplied there would be grave danger to the public health, and that when in 1936 he reported that the water supply was satisfactory he omitted to point out what he really knew—namely, the danger which he had appreciated five years earlier. Dr. Holden denied this.

He was also asked what steps he took to prevent householders drinking water from their own cisterns after he knew the water to be contaminated. Dr. Holden replied that the precautionary measures taken on November 1 at the source of supply safeguarded the water by November 3, on which date he first knew the water to be infected, but he agreed that nobody visited the unoccupied houses, drained off the water, and chemically treated the tanks.

Precautionary Measures Adopted

When the inquiry was resumed on Tuesday, December 28, Dr. Holden was further cross-examined by Mr. Montagu Lyons, who asked first as to the dates when the Addington well was chlorinated. The witness said that the records would be with the borough engineer. The borough engineer, like himself, had been under the impression that the supply had been continuously chlorinated since an earlier complaint was made, but he discovered at the beginning of the outbreak that only intermittent chlorination had taken place.

Asked how many cases would be brought to his notice in the same area before he decided that an outbreak was probably beginning, he replied that two or three cases of any infectious disease in the same neighbourhood would cause him to think seriously of the likelihood of spread. But he desired to make it plain that at first the water was not specially considered. It was one of a number of things, including milk and other articles of food, which had to be examined, and there was no reason at the end of October, when the first four or five cases had been notified, for giving water the priority.

Dr. Holden was questioned as to a statement he had made that in recent years water had seldom been found to be the cause of typhoid. He said that the statement was a fair one, though it might have been amplified. Certainly the most serious outbreak of recent years (Bournemouth) was not due to water. Asked why in a

statement issued by him on November 9 he had said that boiling of the water was unnecessary, he said that the matter was discussed in the Public Health Committee, which so decided. He did not agree that it would have been a helpful precaution. The water supply was already being effectively chlorinated two days before there was anything to suggest that water was the cause of the outbreak. Asked if he refused to take any suggested precautionary measures on the ground that a panic would be created, he said that the word "panic" was used at a meeting of residents in the area which he had attended; if he used it himself it was in connexion with the broadcasting of information.

Notification to Croydon Practitioners

In reply to a further question, Dr. Holden said that the twenty-six doctors in the affected area of South Croydon were informed of an outbreak of typhoid on November 1, and all the 150 doctors in the borough on November 4. If a local medical committee had been available he would have been happy to consult it.

Is there a local Division of the British Medical Association?—Yes.

Could you not have applied to the officers of that Division?—If I had applied to the secretary of the Division, whom I know very well, he would have called his committee together, but that would have meant delay.

They are all on the telephone, surely a meeting could have been summoned the same night. You do not suggest that had that been done any one of those gentlemen would have refused to treat it as a matter of extreme urgency? Can you imagine the secretary refusing to give it immediate attention?—I think the secretary would have done what he thought was right. I have always found the secretary of the Division ready to co-operate.

Mr. Lyons referred to the letter in the *Times* of November 22, signed by Lord Dawson and Sir Kaye Le Fleming, and taking up their remark about lack of co-ordination between departments, asked what co-ordination there was between Dr. Holden's department and that of the borough engineer. Dr. Holden replied that the co-ordination was in the submission of the results of the bacteriological examinations to him for his opinion.

The Chairman (Mr. H. L. Murphy) said he would not suggest that this cross-examination was irrelevant, but it had arisen out of some temperate comments on the *Times* letter which were made by Sir Walter Monckton at the beginning of the proceedings. He understood that Sir Walter's remarks were addressed to the point that the two distinguished signatories, like many much less distinguished persons, did not appear to have made themselves acquainted with the terms of reference of the tribunal.

Sir Walter Monckton said that that was the case. He was making the assumption that Lord Dawson and Sir Kaye Le Fleming had not seen the terms of reference, which were not confined to an inquiry into the causes of the outbreak, but extended to the steps taken to deal with it. Had they done so they would have refrained from stating that there was a defect in medical administration in Croydon.

Preventive Inoculation

Mr. Lyons asked Dr. Holden what were his grounds for stating that he had consulted several medical colleagues on the subject of prophylactic inoculation, and medical opinion was against it. Dr. Holden replied that he had consulted the borough bacteriologist, also Dr. E. T. Conybeare of the Ministry of Health, and a local practitioner, and their opinion was against inoculation on the ground that immediately afterwards—he thought it was a well-known fact pertaining to all methods of inoculation—a negative phase occurred during which the individual might be more susceptible. He was definitely advised not to recommend universal inoculation.

On the general question of co-operating with the local profession, Dr. Holden said that he had been medical officer of health for a good many years, and he had never wilfully ignored private practitioners. In this typhoid outbreak he had followed the practice always adopted by medical officers of health.

He added that he had attended a meeting summoned by the B.M.A. Division later in the month (the 24th), when a number of recommendations were made. In reply to the Chairman (Mr. Murphy) he said that he was himself a member of the B.M.A. and of the Croydon Division, but he could not attend the meetings regularly as the time conflicted with meetings of his official committees.

Co-operation with the Local Profession

Dr. Holden was next cross-examined by Mr. A. H. Forbes, appearing for the Croydon Division of the B.M.A. and the Local Medical and Panel Committee. He directed attention to an article in the *Medical Officer* of November 27, which stated that it was neither usual nor useful for the medical officer of health in times of urgency to confer with representatives of the local medical profession. He hoped Dr. Holden did not agree with that "heresy." Dr. Holden repeated that if there had been a local committee of doctors available he would have been happy to seek their help, the Public Health Committee consenting.

The article further says, "Lord Dawson is not fully acquainted with modern public health practice." Do you approve any modern public health practice which considers it generally not useful for the medical officer in times of urgency to confer with local medical practitioners?—I think that if the local profession have a standing committee it could and would be of great assistance to the medical officer of health.

Then if the local medical practitioners had had in existence at the time of this outbreak a standing committee you would gladly have co-operated with it?—Provided that the standing committee was recognized by my council.

And you would have furnished the committee with all relevant information?—Subject to the consent of my committee.

Typhoid in its early stages is difficult to diagnose?—From clinical symptoms alone, yes.

And it is important that diagnosis should be made as early as possible, both from the point of view of the patient's nursing and diet and from the point of view of contacts?—Yes, but I do not think that in the early stages of typhoid there is much risk, if any, from contacts.

Is there risk at any stage prior to the probable date of diagnosis?—That is a difficult question; the date of diagnosis may be as late as the third or fourth week, and in that case there might be a certain risk.

But in practice, as soon as typhoid was diagnosed, one would advise all the usual precautions to prevent infection by contacts?—Yes, understanding by "contacts" those attending the patient.

It is ordinary practice as soon as even a tentative diagnosis is made to give instructions in the household concerning precautions?—If I was the medical attendant I should give such instructions.

Have you ever been in private practice?—A long time ago, for about six months.

When you notified the doctors of South Croydon on November 1 how did you discover their names?—From a list of doctors in my possession and from a local street directory.

I want to draw attention to the letter you sent. It tells the doctors nothing as to the possible cause of the outbreak nor does it say where the cases are occurring. Is that likely to be of any use to men in private practice?—Yes.

Even though the letter says nothing to indicate that the source of infection was water?—Yes.

Do you agree that if at any time you could have told these doctors that the source of infection was water and that the water was supplying the houses in certain streets it would have been of immense value to them in making a diagnosis or a provisional diagnosis?—I do not see that it would have been any more useful than drawing their attention to the fact that typhoid was in Croydon, more especially at a time when I was not sure by any means that any particular item of food or drink was implicated.

I suggest that if a practitioner sees a doubtful case and knows it is within an infected area, the house being on an infected water supply, he would diagnose the case as typhoid at once?—When he knows that the water supply is infected, yes. But I did not feel justified in notifying the practitioners concerning any particular source of supply until I had more information at my disposal.

Did that apply as late as November 6?—Strictly speaking, it applies even now, for it is all presumption.

Mr. Forbes had not completed his questions when the court rose.

ONE HUNDRED AND SIXTH ANNUAL MEETING
OF THE

BRITISH MEDICAL ASSOCIATION
PLYMOUTH, 1938

THE one hundred and sixth Annual Meeting of the British Medical Association will be held in Plymouth next summer under the presidency of Dr. Colin D. Lindsay, senior physician to the Prince of Wales's Hospital, Plymouth. The Sectional Meetings for scientific and clinical work will be held on Wednesday, Thursday, and Friday, July 20, 21, and 22, the morning sessions being given up to discussions and the reading of papers. The Annual Representative Meeting for the transaction of medico-political business will begin on the previous Friday, July 15. The full list of presidents, vice-presidents, and honorary secretaries of the seventeen Scientific Sections will be published in an early issue of the *Supplement*. Other details of the arrangements for the Annual Meeting will appear in subsequent issues. We publish below the first of a series of descriptive and historical articles on Plymouth and its medical institutions.

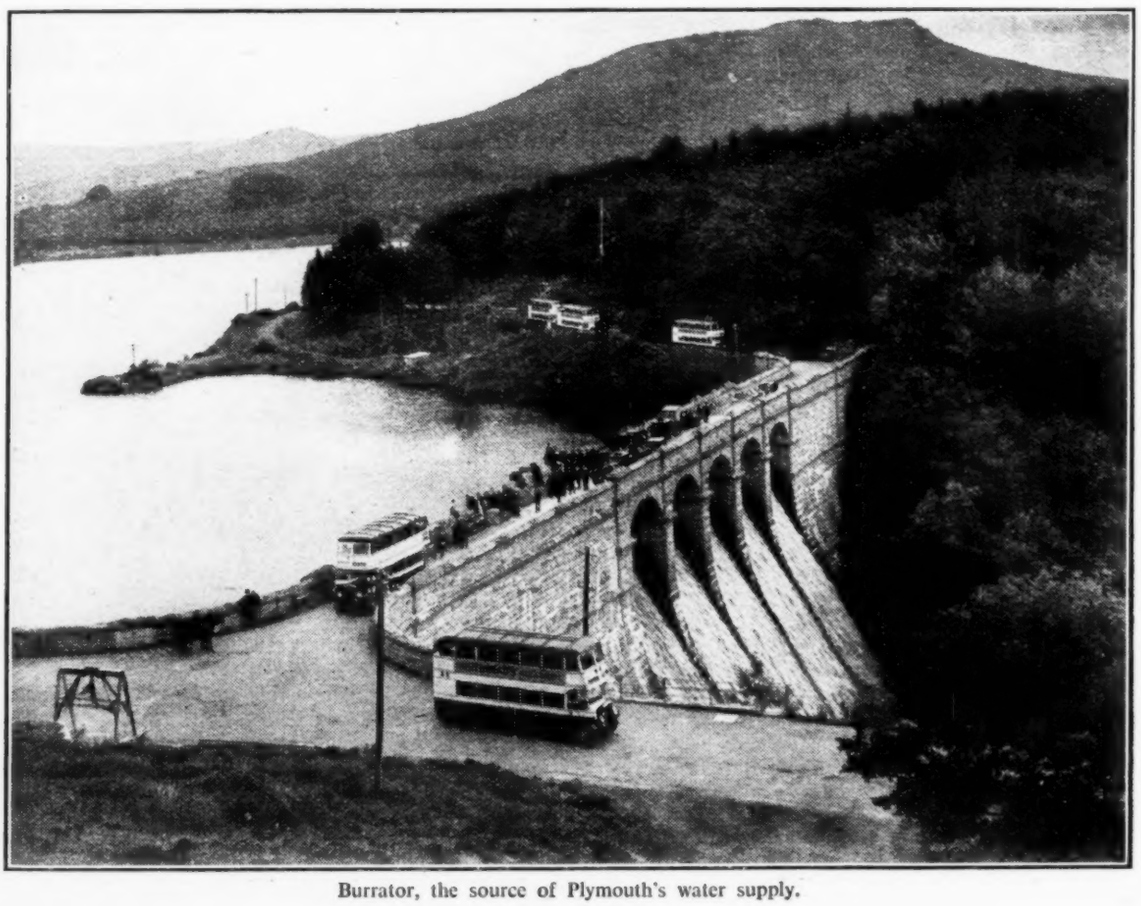
PLYMOUTH YESTERDAY AND TODAY

In choosing Plymouth as the venue of their Annual Meeting this year the British Medical Association will come to "no mean city." Its claims to distinction are many. It has played a prominent part in history and the development of the Empire, and to the sciences and arts its sons have made no less a contribution.

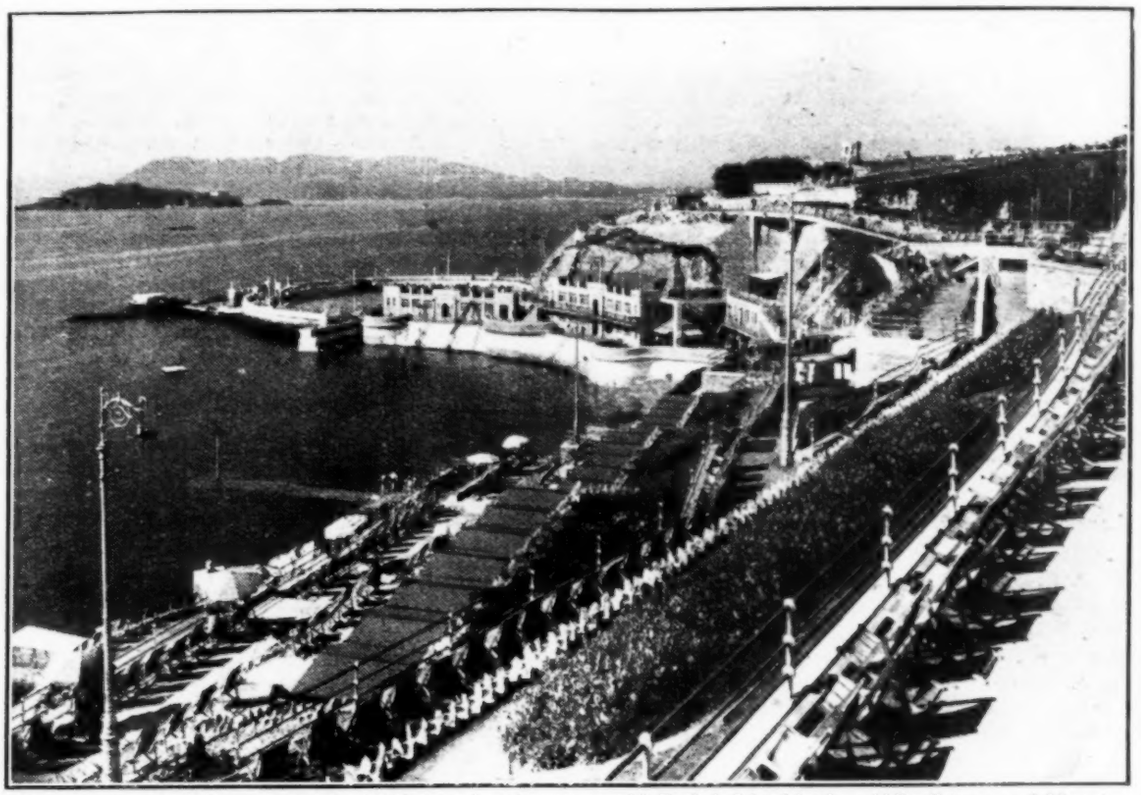
As in most nations, but seldom in towns, the history of Plymouth begins in the region of myth and legend. Her geographical position and natural surroundings were such as to appeal to those people who inhabited ancient Britain, and it is claimed that the Damnonii not only lived there but spread over the county to adjacent Cornwall. During the Anglo-Saxon period Plymouth, first frequented as a fishing station, gradually rose into a place of note. Late in the eighth century the Danes landed in England, and not many years afterwards made their way into Devonshire, which they are reputed to have inhabited for some time subsequent to 786. Devon was one of the last districts to submit to Norman rule. In Domesday Book, compiled in 1086, Plymouth, then known as Sutone (South Town), is described as being held by the King in demesne. Afterwards the town was divided and the greater part went to the Priory of Plympton, with which rested its government for many years.

First Charter

As far back as 1439 the charter of incorporation was granted, and the first Mayor, William Ketrich, was described as "one of the most honest and discreet men



Burrator, the source of Plymouth's water supply.

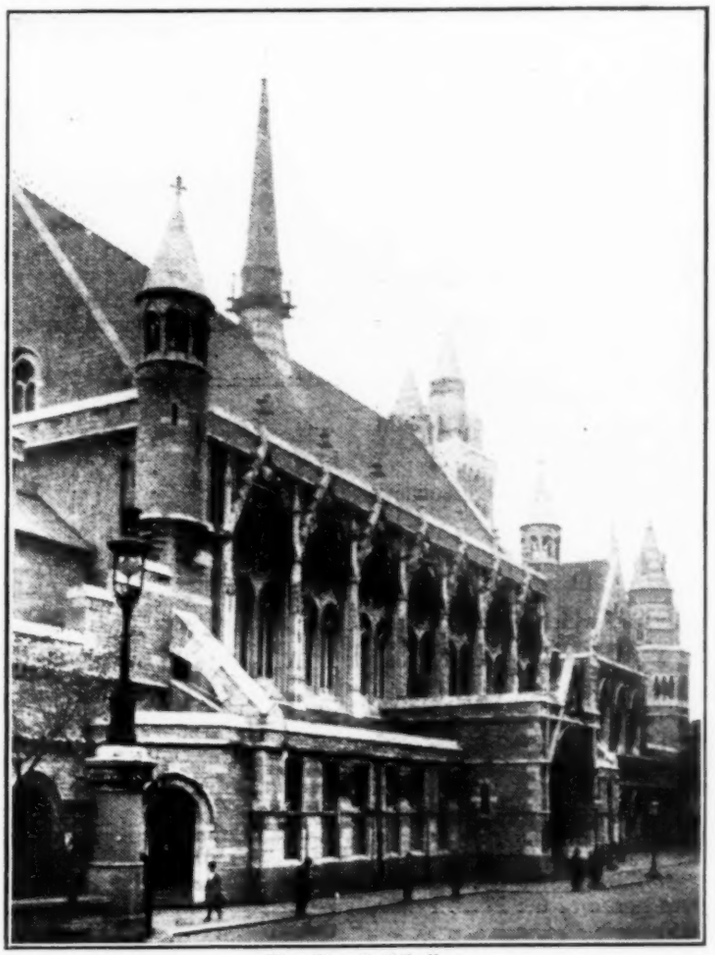


Part of Plymouth Hoe, showing the bathing pool and terraces, with Drake's Island in the middle distance and Mount Edgcumbe in the background.

now dwelling within the propound boundaries." To commemorate his election His Worship provided a feast, composed of a pie of "all sorts of fish, flesh, and fowl that could be gotten. It was fourteen feet long and four feet broad, and an oven was built for the purpose of its baking." And to this day Mayors on election day give their luncheons, though on more modern lines.

Drake as Mayor

Sir Francis Drake was Mayor in 1581. Although better known for his exploits at sea—and whenever Plymouth is mentioned Drake finishing his game of bowls before attacking the Armada comes to mind—it should be remembered that it was he who first provided the town with an adequate water supply. Also regarded as of sufficient importance to be placed on record is the fact that he "set a mariner's compass on the Hoe." More notorious, though less practical, was the action of another Mayor who struck the town clerk as he sat upon the bench, because the official addressed him without his title of "Worship."



The City Guildhall.

Invaded by the French, "spoyled by the Bretons," Plymouth through the centuries suffered from piracy, and in addition to the plague was a victim of a "sweating sickness" known as sudor anglicus, which raged in the fifteenth century. But the famous Sabbath Day siege, well known to students of the Civil War, marked an epoch of first importance in national as well as local history; and since then, generation after generation, its name has been writ large in the annals of the country, until to-day it ranks as a great naval arsenal, as an important military garrison and seaplane base, and as a commercial port visited by steamers to and from all parts of the globe.

Noted Medical Men

Physicians and medical men of Plymouth were among its earliest scientific observers, and several outstanding personalities come to mind. Dr. James Yonge, F.R.S., who died in 1721, not only practised with much success but wrote a number of philosophical and medical works. Dr. Huxham, the author of a celebrated treatise on fevers which was translated into several foreign languages, practised and died in Plymouth. It is said that the adoption of the principles enunciated by him saved the life of the then Queen of Portugal.

Dr. John Mudge gained high reputation, not only by his skill as a medical man but by his knowledge of mathematics and optics. He wrote several medical works. So also did Dr. Woolcombe. Dr. Edward Moore dealt largely with zoological subjects, and Mr. C. N. Moore was the author of several works on cancer. Sir William Snow Morris, the scientist, was born at Plymouth, and John Prideaux became eminent as a chemist. Dr. Leatherby, medical officer of health of the City of London, who died in 1876, was a Plymouth man.

Jonathan Heard was an expert on matters electrical and chemical. A public lecturer at the age of 17, he lost his sight four years later through a sudden explosion of silver fulminate, but despite this handicap continued his work, particularly as a public experimenter.

In more recent days one recalls the names of Dr. Cloy, Dr. Paul Swain, Dr. Hingston, a well-known local philanthropist, Dr. Rolston, and A. Bertram Soltau, who had the rare distinction of holding the Fellowship of both the College of Physicians and the College of Surgeons, as a few among many who carried on a noble tradition which is being worthily maintained to-day.

An Up-to-date City

It must not be assumed that Plymouth, which was raised to the dignity of a city in 1928, is content to live on its past. It may have first elected its Members of Parliament as far back as 1292, and its recordship may date from 1480, but in every essential respect it is modern, with broad thoroughfares, imposing public buildings, and all the amenities that reasonable enterprise demands. As "the centre of a hundred tours" it can meet the most exacting claims of the visitor, who will undoubtedly be impressed by its contrasts.

It is possible to play bowls under the watchful eye of Drake, to stroll on the Hoe—the finest promenade in Europe, some say in the world—and watch with increasing fascination the ever-changing panorama of the Sound, flanked on one side by the wooded slopes of Mount Edgcumbe, and on the other by the heights of Bovisand. The rocky foreshore, with its unique buildings, provides an ideal spot for bathing, and on the terraces immediately above sun-bathing can be indulged in.

Elizabethan Plymouth

Near by is the Smeaton Tower, which for a century stood on the Eddystone Rocks until replaced by Douglass's lighthouse in 1882. A walk of a few minutes brings one to the Elizabethan Plymouth, passing en route the Citadel with its massive ramparts built by Charles II. No. 32, New Street is a typical Elizabethan house recently restored, and it is possible here to glean some idea of the home surroundings of the old sea-dogs of Devon. On one of the entrance piers to Sutton Pool stands the *Mayflower* Memorial, marking the spot where the Pilgrim Fathers embarked for America. The rebuilt residence of Cookworthy, whose name is linked with Plymouth china, and a distillery, formerly a religious house of the Black Friars, are in the vicinity.

Ancient and Modern

The mother church of St. Andrew dates from 1385. It has a fine tower built by Thomas Yogge, a wealthy merchant, in the time of Henry VI, the town "finding the stuff." St. Andrews, which was restored in 1874–5 by Sir Gilbert Scott, stands on the eastern side of a spacious square. On the southern side is the Guildhall (Early Pointed), some sixty years old, opened by Edward VII when Prince of Wales. Its beautiful painted windows portray five or six hundred years of Plymouth history. On the northern side are the municipal buildings, and in the Mayor's Parlour is to be seen the White Rod of the Lord High Steward, an office long held by one of the Royal Family.

Devonport and the Navy

Although Devonport and the former township of Stonehouse between were once separate entities, they are now incorporated into the municipality of Plymouth. But Devonport, with its extensive dockyards, its naval barracks, and its Royal Naval Engineering College, possesses an individuality all its own. It has a big part to play in national defence, and in the immense naval docks are all kinds of ships of war in various stages of completion. Naval uniforms are to be seen everywhere, and thousands of workmen pour through the gates daily to and from their work. The main establishment is the North Keyham Yard, where extensions were completed in 1907 at a cost of nearly £5,000,000. Further improvements are now under consideration. The Royal William Victualling Yard, at the gate of which is a statue of William IV, and the headquarters of the Royal Marines, are in Stonehouse.

Mention should be made of the city's museum and art gallery with its many treasures—one among the places to be visited. Another building which should be visited is Plymouth Institution, where the pursuit of the arts and sciences continues with ever-increasing vigour. Its museum, and an extremely valuable reference library containing some priceless works, are well worth inspection. It is interesting to note that in a long line of distinguished men the name of Dr. J. Elliot Square, member of an honoured family in Plymouth, appears as a President.

It may be judged that the visitor to Plymouth will not need to seek that which interests and stimulates the imagination. With almost a plethora of these things the problem will be what to miss because of other demands on time.

The eleventh annual report of ULAWS (the University of London Animal Welfare Society), 42, Torrington Square, W.C.1, has now been published. Sir Frederick Hobday, president of the society, draws attention in a foreword to the support which animal welfare is receiving from scientific men and women. The work of ULAWS during the past year has expanded considerably. In the branches in ten colleges of the University of London a large number of meetings on humanitarian and natural history subjects were held. In addition, members, both graduates and students, delivered lantern and film lectures in schools, clubs, women's institutes, etc. There have been important developments in the society's campaign against the gin trap. During the year the House of Lords Select Committee on Agriculture (Damage by Rabbits) issued its report. ULAWS welcomes the positive recommendations made in this report, but points out that on questions of fact the Select Committee has achieved a compromise between conflicting opinions and interests rather than scientific appraisement of the evidence. It claims that the progress made towards solution of the problem of trapping is "a justification of the scientific approach to problems of animal welfare."

HEALTH OF THE SCHOOL CHILD

CHIEF MEDICAL OFFICER'S REPORT*

Sir Arthur MacNalty, in his annual report as Chief Medical Officer of the Board of Education for 1936, points out that education includes physical education, and that in order to obtain full advantage from it a child must receive an adequate and balanced diet. To achieve this end it is important that meals provided for school children requiring supplementary nourishment should be rich in those essential foodstuffs which may be deficient or lacking in their home dietary. Such articles are milk, cheese, eggs, butter, green vegetables, fruit, and meat. The question of the proper selection of children for free meals is dealt with, and three essentials for success are laid down—accurate ascertainment, efficient provision, and a proper income scale. The need for greater appreciation of the value of milk and for improvement in the arrangements and dietaries in the schemes for provision of solid meals is emphasized. In this connexion the example of certain authorities who have made substantial improvements in their schemes is quoted. Mention is made of the importance of teaching girls the art of managing a home efficiently, for experience shows that malnutrition in the child is sometimes the result of bad home management rather than of poverty.

The introduction concludes with a passage relating to school camps, in which the following sentence occurs:

"If the world could be remoulded to our liking every school would be an open-air school in a country or seaside setting, with ample facilities for playing fields and the study of nature."

Nutrition of the School Child

In Chapter I an account is given of the additional information on the subject of nutrition which became available during the year. Several important reports have appeared, notably a memorandum on the *Nutritive Value of Milk*, prepared by the Advisory Committee on Nutrition; the first report of the same committee; and the report of the Technical Commission on the *Physiological Bases of Nutrition*.

From the reports of school medical officers it would appear that in many areas the physique of elementary school children as shown by height and weight measurements has continued to improve. The method of clinical assessment introduced in Administrative Memorandum 124 is again discussed and a comparison made between the findings for 1935 and 1936. During 1936 the nutrition of 1,726,755 children examined at routine medical inspection was assessed by some 1,300 observers. The percentages placed in the four categories were almost identical with those in 1935: 14.6 per cent. in A (excellent), unchanged; 74.2 per cent. in B (normal), as against 74.1 per cent. in 1935; 10.5 per cent. in C (slightly subnormal), as against 10.6 per cent. in 1935; 0.7 per cent. in D (bad), unchanged.

The nutritional condition of children in the Special Areas is discussed, and the need for increased provision of extra nourishment in these areas is stressed. Other subjects discussed in this chapter are the causes of subnormal nutrition and physique, figures for heights and weights in different areas compared with those of the same areas in previous years, a comparison between the nutritional state of a group of secondary school children in Surrey and another group in Spennymoor.

Provision of Free Meals and Milk

During the year 139,662 children received free solid meals. The total number of meals, including milk meals, provided free of charge increased from 87,000,000 in 1935–6 to over 100,000,000 in 1936–7. This increase of 13,000,000 was due to the rapid rise in the number of free milk meals provided, which has increased from 42,200,000 in 1934–5 to 63,700,000 in 1935–6 and 78,300,000 in 1936–7. The statistics are followed by a discussion of the Milk in Schools Scheme, in which certain difficulties in the operation of the scheme are mentioned and in which a table is given showing the advantage of fresh milk over certain dried milk preparations. Examples are given of the dangers which arise from raw milk, and these show that the Board's policy of advising that pasteurized milk should be used wherever possible is fully justified.

Physical Education

In January, 1936, the Board issued Circular 1445, which was a statement of its views as to the policy to be pursued in regard to two aspects of physical education and was designed to assist authorities and others in preparing a comprehensive plan of development. The later part of the year saw the initiation of further Government plans for encouraging recreational and physical activities among those who have left school.

Reference is made to the setting up of the National Advisory Council for Physical Training and Recreation, and the chapter also contains a description of the duties of organizers of physical training.

Medical Inspection

The discussion of the system of routine medical inspection which was begun in the 1935 report is continued. The prevalent opinion of school medical officers appears to be that changes which may be introduced should take the form rather of additions grafted on to the present framework of the system than of radical changes in the framework itself. The statistics given in the chapter include those relating to the staff of the School Medical Service and to the findings of medical inspection. The subjects of medical inspection and treatment in secondary schools and of inspection and treatment in junior instruction centres for the unemployed are also discussed.

Medical Treatment

The relations between the School Medical Service and other bodies such as the voluntary hospitals, public health authorities, and the medical profession generally are discussed, and the need is emphasized for full co-operation between all those who take part in the medical treatment of school children. Schemes for the treatment of certain defects are discussed, and it is pointed out that orthopaedic schemes are a good example of what can be achieved by the co-operation of numerous bodies, both public and private.

Other subjects considered in Sir Arthur MacNalty's report are nursery schools and the care of young children; the School Dental Service and the Medical Research Council report on the influence of diet on caries in children's teeth; the teaching of mothercraft and hygiene in schools; and the education and training of blind children. During the year a medical officer of the Board, in company with H.M. Inspectors, paid visits to a number of school camps for elementary school children. A general description of these camps is given and recommendations are made with regard to them, the importance of ample floor space and ventilation in the sleeping-quarters being emphasized. Lastly, attention is drawn to the importance of continuity of medical care throughout life and to new legislation connected with the National Health Insurance Scheme and with the Factory Acts designed to that end.

Dr. Carl Koller (Karl Köller), who in 1884 at the age of 27 introduced cocaine as a local anaesthetic in ophthalmic surgery, celebrated his eightieth birthday in New York on December 3.

* *The Health of the School Child.* Annual Report of the Chief Medical Officer of the Board of Education for 1936. London: H.M. Stationery Office. (2s. 2d., post free.)

Reports of Societies

LEPROSY

At a meeting of the Royal Society of Tropical Medicine and Hygiene, at Manson House on December 9, 1937, with the president, Lieut.-Colonel S. P. JAMES, in the chair, papers were read by Dr. E. MUIR and Dr. WILLIAM HUGHES.

Epidemiology and Control of Leprosy

Dr. Muir dealt with this aspect of the leprosy problem, pointing out that leprosy belonged to a certain stage of human development. It was rare among nomadic tribes and aborigines leading an unmixed tribal life, but tended to spread when primitive people settled down to agriculture, and when they first came into contact with civilization. Leprosy again tended to disappear when a certain standard of living and sanitation had been reached. Leprosy was a disease of the crowded house, room, and bed, and the more crowded and insanitary these were the more likely it was to spread. In India the joint family system had an important bearing. The rise and fall of the leprosy curve in an area was not due to the development of physiological immunity so much as to the growth of a mental and social immunity. As the disease increased in the community its members learnt to recognize it and take precautions. These precautions might not be adequate or sufficient to eliminate the disease, but they generally curtailed it. The place of treatment in the control of leprosy was an important one, but one which had often been exaggerated and misunderstood. We had no specific treatment for leprosy any more than we had for tuberculosis. The most we could say was that when leprosy was compared stage by stage with tuberculosis it proved somewhat more amenable to treatment than the latter disease. In both, the main reliance must be placed upon general methods and improvement of the health of the patient. When this could be secured—and with the help of certain special remedies, such as chaulmoogra oil and its preparations—the majority of cases might be expected to recover, though the more the disease advanced beyond a certain stage the more difficult and hopeless did it become.

One of the essential factors in the control of leprosy was the large, well-staffed leper settlement. In the modern leper settlement, some of the best of which might be seen in Nigeria, the patients were suitably housed and spent cheerful and useful lives. The well-run leper settlement was in fact a model village, or cluster of villages—a centre of culture and progress—not only benefiting its own inhabitants but potentially a source of enlightenment and sanitary and social development for the whole area. Leprosy in countries in which it was endemic was so inextricably bound up with economic, social, educational, and sanitary problems that its control could only advance simultaneously with the solution of these problems. It was significant that in this country the lazaret was the precursor of the modern hospital, and that many of our early public health laws were passed for the control of leprosy.

Tuberculoid Leprosy

Dr. Hughes confined his observations to tuberculoid leprosy, and in his introductory remarks pointed out that though the existence of giant cells of the Langhans type in leprosy had been vigorously denied by Hansen and Looft, Jadassohn had described them in 1898. Since then many workers had noted their existence. Wade was the first to give a systematic account of a special form of leprosy associated with a giant-celled or epithelioid infiltration. This form was much more closely allied to the neural than the cutaneous type, although, clinically, it could be easily mistaken for the latter. The tuberculoid lesion seemed to be common in races which had been afflicted with leprosy from time immemorial. It might in a way be regarded as an expression of racial immunity, or indeed of racial allergy, if such a term was permissible. According to the recent literature the incidence among Northern Indians was about 60 per cent. of the total cases of leprosy. Bacilli were very scarce in these lesions, and might be impossible to find except in serial sections. The tuberculoid lesion in this respect resembled such conditions as, for example, lupus, Boeck's sarcoid, the syphilides, etc. Like other forms of leprosy it was subject to occasional exacerbations or "acute reaction." This was a local phenomenon not attended by fever, loss of weight, increased sedimentation rate, etc., which characterized acute reactions in the cutaneous type of leprosy.

In assessing the significance of tuberculoid leprosy a comparison with the tissue responses in tuberculosis was inevitable. Both diseases were associated with an acid-fast bacillus and the epithelioid giant-celled lesion was common to both. In leprosy, however, there were two other types of tissue response—the chronic inflammatory type of exudate associated with early neural leprosy and the cutaneous exudate characterized by the lepra (Virchow, or foam) cell. The numerical relation between the bacilli and the cellular exudate in tuberculoid leprosy presented a sharp contrast with that seen in the cutaneous type, and if a cutaneous case of leprosy responded to the same degree as a tuberculoid case, the resulting tuberculoma would fill St. Paul's. Recession of the lesions during severe debilitating disease had previously been noted. If a tuberculoid lesion receded the bacilli were so scarce at any time that such recession could be, and often had been, mistaken for cure. It was only to be expected that in countries where there was a high incidence of tuberculoid leprosy superficial observations might easily lead to mistakes. In all probability this was the basis of many of the spurious "cures" in the literature of leprosy. It was quite common for authors to record "pushing" the heavy metals until the symptoms of metallic poisoning supervened. At this stage it seemed the highest percentages of cures—in reality recession of lesions—occurred.

Whatever might be the argument for abolishing the hyperergic state in the case of tuberculosis, as advocated by Rich, Pagel, and others, it was extremely doubtful if such measures should be resorted to in tuberculoid leprosy. In this disease the prognosis was on the whole fairly good. Occasionally—for example, in cases of iritis—it might be justifiable to use drugs in dangerous doses to abolish the cellular exudate in the uveal tract. But the difficulty was to find a drug which would do this consistently. At the moment it was doubtful if any single drug or combination of remedies could be relied on to stave off the blindness which was such a distressing feature of these cases. The study of tuberculoid leprosy was new, but already sufficient facts had been accumulated to give a fresh point of view in leprosy, and perhaps in other forms of proliferative disease.

General Discussion

In the discussion which followed Dr. J. M. H. MACLEOD said that tuberculoid leprosy was very like sarcoid. For many years histologists had been debating the relationship between sarcoid and true tuberculosis cutis in the same way as they were wondering what was the precise histological relationship between tuberculoid and cutaneous leprosy. The bacillary position was of course different, because in nerve leprosy one occasionally found bacilli, but not often, whereas in sarcoid he had never succeeded in finding tubercle bacilli, though some other people had reported doing so. Dr. HOWARD pointed out that in Southern Nigeria the tendency was to develop a cutaneous type of leprosy, whereas in the north the neural and tuberculoid types were found. Dr. Muir had said one of

the common signs of leprosy in India was visible enlargement of the auricular nerve; this was not his experience in cases in Nigeria. Dr. CHESTERMAN supported Dr. Howard's statement regarding the rarity of thickened nerves in African lepers.

Sir JOHN MEGAW said that in India leprosy was often a mild disease. He deprecated over-exercise or exercise in the heat of the day in leper establishments, emphasized the importance of a nourishing diet, and expressed surprise that specific treatment with leprous antigen prepared from the lesions in nodular leprosy had not been given a more extensive trial. Dr. A. FELIX drew attention to the recent experimental transmission of leprosy to the Syrian hamster, and suggested that the leprous tissues of this animal might prove a satisfactory source of antigen supply. Dr. C. J. AUSTIN had on two occasions operated on lepers in Fiji with nerve abscess in cutaneous leprosy; he wondered if the tuberculoid cases really constituted a type distinct from the nervous or cutaneous types. Dr. GUSTAVE TAYLOR of Formosa said that among Chinese lepers demonstrable enlargement of nerves was common. If the patient turned his neck so as to stretch the sternomastoid muscle the great auricular nerve was frequently palpable: not only could one feel it but one could actually see it.

In reply, Dr. W. HUGHES agreed that tuberculoid leprosy was very like sarcoid. He had not encountered nerve abscess in Malaya, but there 80 per cent. of cases were of the cutaneous type. Leprosy manifested itself clinically as nodular skin and trophic lesions; without cellular reaction there were no manifestations of disease, though bacilli might persist in the tissues. Dr. E. MUIR said he had seen three or four cases of nerve abscess in cutaneous leprosy; he thought two of the patients had developed caseous lesions within the nerves as a result of deterioration of health. Nerve leprosy was common in Southern Nigeria and India. He could not say why it was not found more often in Malaya. Demonstrable nerve enlargement was common; he had been studying leprosy for some years before he realized how really common it was.

BRONCHOGENIC CARCINOMA

At a meeting of the Liverpool Medical Institution on December 2, with the president, Professor R. E. KELLY, in the chair, a discussion was held on bronchogenic carcinoma.

Dr. C. S. ANDERSON said that there had been a small real increase in the incidence of bronchogenic carcinoma in recent years. The great majority of, if not all, lung cancers originated in bronchi; they might be divided macroscopically into four types—hilar, nodular, miliary, and diffuse. Microscopically they might be squamous, adenocarcinomatous, or anaplastic, and the extreme pleomorphism of the cells made definite classification very difficult. Diagnosis was established by the clinical pathologist from a study of the sputum or of sections removed at biopsy.

Clinical Pathology

Dr. ROBERT COOPE discussed the pathological basis of the signs and symptoms. An early neoplasm appearing in a bronchus acted as a foreign body and produced a cough which was short, hard, perhaps hacking, and at first quite unproductive. As the nodule increased in size it might ulcerate and bleed, giving rise to haemoptysis. When the growth was large enough to produce an appreciable, but still partial, blocking of a large bronchus, it seriously interfered with the proper ventilation of the lung. A localized and unilateral wheeze might be heard, and dyspnoea might appear early. The poorly aerated part of the lung was very susceptible to infection. With complete blocking of the bronchus the lung beyond it became deflated and collapsed (obstructive atelectasis). Obviously quite a small growth might completely block even one of the larger bronchi at a time when there were few symptoms and the patient appeared comparatively well; the resulting physical signs were a lack of expansion of the lung, dullness to percussion over the affected lobe, and a wide area of silence. In other words, the physical signs might be out of all proportion to the symptoms—in striking contrast to the state of affairs in simple abscess or tuberculosis of the lung. Suppurative changes in the distal part of the lung were likely to occur in the form of atelectatic bronchiectasis, lung abscess, pleurisy with or without effusion, empyema, or pyopneumothorax. The combination of infection with defective lung aeration sometimes resulted in a surprisingly early appearance of clubbing of the fingers.

Long before it had completely obstructed a bronchus, however, a malignant bronchial growth might have invaded local structures, and if it happened to be near the hilum of the lung would then show some of the invasive manifestations of a mediastinal tumour. Paralysis of the phrenic nerve with consequent elevation of the diaphragm was particularly important; it was especially apt to occur on the right side by secondary involvement of the small mass of glands through which the nerve passed. If the neoplasm began in a smaller bronchus near the periphery of the lung there would be early pleural involvement, and perhaps effusion; extension also occurred towards the hilum, with invasion of the corresponding lymph glands. One type of the disease was caused by a growth which did not obstruct a bronchus until some considerable time after it had spread, fanwise, along the lymphatics, producing a chronic indurative condition, with the *x*-ray appearances of "unresolved pneumonia"; the same *x*-ray picture might be given in the early stages of infection of the lung distal to a bronchial stenosis. The "pneumonia" did not resolve, however—a sinister persistence in a person at or beyond middle age. At any time the growth might begin to necrose, producing an irregular fever, clubbing of the fingers, and toxaemia; in this event cavitation of the lung was much more ragged than that due to suppurative changes distal to a blocked bronchus. Secondary metastases might occur anywhere, and at times a metastatic growth in an obvious place, such as skin or skull, was the presenting sign; a secondary deposit without an obvious primary should always suggest carcinoma of the lungs. Finally, there were the general symptoms produced by any cancer; loss of weight and cachexia were usually late symptoms.

Early Symptoms

Persistent cough, haemoptysis, and dyspnoea were the most likely early symptoms; an analysis of the earliest symptoms of a series of fifty-four cases supported this, and underlined also the importance of secondary inflammatory lung lesions distal to the affected bronchus. In these cases there was an average duration of nearly six months between the earliest symptom and the time when the patient first came to hospital. In patients of cancer age haemoptysis occurring for the first time should be regarded as due to bronchogenic carcinoma until it was proved to be caused by something else. Similarly, in patients of that age who had not previously had "chest trouble," any cough, or "influenza," or atypical pneumonia, or pleurisy which did not clear up satisfactorily might be due to bronchogenic carcinoma. In an elderly person pleurisy with effusion, empyema, or lung abscess which appeared to have no obvious cause might be a complication of the disease. A cough accompanied by dyspnoea which was not adequately explained by the physical signs in the lung or by the condition of the heart, and which was of recent appearance, might be due to partial blocking of a large bronchus by new growth. All these conditions called for investigation. The pathology of the disease did not encourage much hope of cure. The growths which were likely to be diagnosed early were those which could be seen through the bronchoscope, and

which were, therefore, near the hilum and liable to show early spread to the glands at the hilum—not hopeful subjects for an attempt at surgical cure. If the growth was situated more peripherally so that the surgeon had a chance of removing one or more lobes through healthy bronchial tissue there was much more difficulty in making an early diagnosis.

Place of Surgery

Mr. JOHN T. MORRISON referred to fifteen cases in the literature of total pneumonectomy and thirty-nine of lobectomy. Of the former, six out of the seven survivors were claimed as cures; of the latter, so far as records went, at least nine out of the twenty-six survivors, and possibly more. There were among the lobectomies considerably more recurrences to offset the lower operation mortality. In assessing operability, Mr. Morrison set on one side the large number of growths involving the main bronchus, in which cases for the most part only palliative radiation therapy was feasible. He then went on to point out and illustrate radiologically the variability of atelectasis in relation to the size and position of the primary growth.

Drs. T. F. HEWER, G. A. C. LYNCH, and R. H. MOLE exhibited a series of specimens. Mr. J. E. G. MCGIBBON reported some favourable results of treatment with deep *x*-ray therapy, with or without the use of radon seeds, in a series of fifty-five cases of bronchogenic carcinoma in the bronchoscopic clinic of the Royal Southern Hospital. Dr. P. H. WHITAKER, Dr. J. H. MATHER, and Dr. E. T. BAKER-BATES also took part in the discussion.

PUBLIC HEALTH SERVICES AND INDUSTRIAL HYGIENE

A combined meeting of the Society of Medical Officers of Health and the Association of Industrial Medical Officers was held on December 17, when addresses, preliminary to a general informal discussion, were given by Dr. J. J. Buchan, medical officer of health for Bradford, and Dr. Donald Stewart, medical officer, Imperial Chemical Industries, on "The Public Health Services and Industrial Hygiene."

Dr. J. J. BUCHAN said that many cases of illness and accident in factories were in no very remote sense due to conditions arising outside the factory. This only emphasized the need for co-operation between these two services, and the first essential to co-operation was an understanding of each other's field and problems. One primary difficulty was that two different departments of State were concerned—the Ministry of Health in the case of the public health services, and the Home Office in the case of industrial health services. In his own area at least the Home Office was very commonly regarded as having for its province criminal jurisdiction rather than the common health, and this operated disadvantageously in some respects. Something of this feeling had crept into the law and practice of industrial hygiene in that there was a distinct tendency to blame industry for all illness that occurred among the workers. On the other hand, Dr. H. E. Collier of Birmingham University had said truly that industry ought not to be saddled with the cost of illnesses which were really attributable to faulty social conditions and communal ignorance. Dr. Buchan hoped the time would soon come when industrial workers would be subject to some degree of continuous hygienic supervision. It was by no means uncommon to find a young worker failing in health shortly after he had been drawn into industry. During this period of acclimatization to industrial conditions there ought to be closer supervision than at present. Something of this kind was attempted by the more enlightened firms, but it should not be considered that the whole cost was a proper charge on industry, nor should the arrangements be controlled by industry or by the Home Office. It had been the experience of many members of the public health service that employers, when faced with this problem affecting the health of their employees, did not hesitate to consult the officers of the local health authority. That had been his experience in his own city.

The certifying factory surgeon—now called the examining surgeon—ought, in Dr. Buchan's opinion, to have a less circumscribed position than he had to-day. He ought to be more than a mere certifier. The recent change of name was rather futile, because it still indicated that his responsibility was only for the medical examination; it did not imply any duty of continuous health supervision. He thought the arrangement whereby industrial medical officers might have access to school medical records was likely to prove of great value, and it was surprising to find that any doubt existed as to its utility. The school medical record gave impartial and reliable information of profound importance to those who had to do with health in factories. The records were compiled at a time when they were little likely to be influenced by the desire of the parents to find employment for the children, and if made by careful and understanding school medical officers and read by officers of a like kind in other services they were likely to be extremely useful. His own school records were referred to continually in the juvenile employment bureau, as well as in juvenile and ordinary courts and elsewhere.

Dr. DONALD STEWART said that both the public health and the industrial health services aimed at prevention, and had comparatively little to do with curative measures. The general practitioner had been much against them both, and the word "encroachment" had been heard with regard to both, but he believed that that day was over and that the general practitioner now was willing to be helped, and officers in these services were more than willing to help him. In what way were the public health services developing? So far as the public health services were concerned there was ample evidence of extensive development, as was shown by the reports of the central and local authorities. The development on the whole appeared to be satisfactory, but he had one or two criticisms—for example, the public health services did not pay sufficient regard to such matters as housing, recreation, and social amenities. The Factory Department of the Home Office had developed slowly but efficiently, and had lately been concerned in some extremely good work in connexion with the rehabilitation of persons injured in accidents, and, still more recently, in the question of lighting in factories.

The 1,700 industrial medical officers known as factory examining surgeons (Dr. Stewart continued) were a much maligned body of men, but he believed their activities should have wider scope. Again, the Industrial Health Research Board was in its own sphere the finest thing in the world, and its work was quoted more or less as gospel in the industrial medicine of other countries. The bridging of the gap between actual research and the application of it in the workshop, factory, and office was a problem which would have to be solved before any industrial service became fully effective. Another respect in which the industrial health service had advanced was in relation to injuries. The industrial medical officer, whole- or part-time, was necessary to-day even from that one angle alone, to prevent lost time through "stupid things like sepsis," and to aid in the effective rehabilitation of the injured workman. Research was necessary also into industrial working conditions, the comfort of the worker, and the psychological effect of groupings of workers. One of the outstanding questions was to "get across" to the employer the sane medical outlook with regard to his workpeople. In order to obtain the best results the industrial medical officer must be in closest contact for a large part of his time with the employer. He had to be a part of the management. As for the worker himself, he, through his organizations and trade unions, had a very definite interest in the contribution that medicine could make.

Dr. JAMES FENTON from the chair pointed out that the medical officer of health worked under three Departments of State—the Ministry of Health, the Board of Education (which two were indivisible, the Chief Medical Officer of both Departments being the same individual), and the Home Office. He dissented from Dr. Stewart's remark about the medical officer of health and housing, and pointed to the great housing activity all over the country in the direction of which the medical officer had taken a fundamental part. In the subsequent discussion Dr. J. C. BRIDGE, senior medical inspector of factories, said that during his own term in the Factory Department the industrial medical service had become a new service altogether, and the larger it grew the better pleased would be those who had to administer the Factories Act. Personally he could not see how industry as such could produce tuberculosis to anything like the extent that bad housing conditions could produce it; nevertheless, there was a tendency to blame industry for all the illness from which the worker suffered. Dr. T. O. GARLAND suggested that it would be useful if industrial medical officers were given facilities for visiting condemned areas and new housing estates in their districts.

THE MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

At a meeting of the Medical Society of Individual Psychology held on December 9, with Dr. H. C. SQUIRES in the chair, a paper was read by Dr. O. H. WOODCOCK on "The Contribution of Adler to Psychological Medicine: The Relation of the Sexes."

Dr. Woodcock said this subject was chosen as the third in the symposium on Alfred Adler because it had often been a criticism of individual psychology that Adler avoided the issue on sex, and that his concept of "the masculine protest" was merely to use another and inferior title to "the castration complex" of Freud. This indictment had little justification except that, in his revolt from the tremendous stress placed by Freud on sex, Adler had laid more emphasis in his writings on the subjects of the will to power and community (or social) feeling. He taught that an individual must adjust himself to life along three lines—namely, to society, to vocation, to sex—if a completely harmonious personality is to result. The biological urge of every living organism is to complete development characteristic of its species. In his unpublished lecture "Marriage as a Task" Adler described monogamy as the highest sexual goal for mankind, and regards it as a constructive task, requiring infinite patience and understanding, on the part of two people who have determined to enrich and relieve each other's lives. It is a task so difficult of achievement that many fall by the way, but those who survive discover a beauty that transcends all other human relationships. All sexual relations or attitudes other than mating founded on mutual affection and thoughtfulness are useless goals, fictive and demoralizing—the retreats of cowards, foolish short cuts of the lazy, and attempts at domination by the cruel and the egoistic. A sexual illness arose when one person used another only for his or her own profit. Adler said that masculine dominance was not a natural thing, yet all our institutions, our traditional attitude, our laws, our morals, our customs, give evidence of the fact that they were determined and maintained by privileged males for the glory of male domination. Hence the dissatisfaction with the feminine role and the adoption of what Adler called "the masculine protest." There should not be dominance on either side in the sex relation of male and female. Marriage was the highest expression of social feeling, in which the ideal aim should be "to give," and the requirements were exceptional ability to identify oneself with the partner.

Dr. Woodcock then went on to describe Adler's teaching with regard to what he termed the false paths, retreats, evasions, the perversions, the devices of those who have failed to realize marriage as an exercise in co-operation with a partner of the opposite sex. With regard to such aberrations as masturbation, frigidity, impotence, ejaculatio praecox, vaginismus, homosexuality, exhibitionism, fetishism, promiscuity, celibacy, prostitution, masochism, and sadism, Adler believed that many of these were difficult problems, but not insurmountable. The treatment of each would be determined, after analysis of the problem, in the consulting-room according to the methods of individual psychology.

There was an interesting discussion afterwards, to which many of the audience contributed.

OBSTETRICS AND GYNAECOLOGY

At a meeting of the North of England Obstetrical and Gynaecological Society, held in Liverpool on November 26, with the president, Dr. J. W. BRIDE, in the chair, Mr. BRIAN WILLIAMS (Liverpool) read a note on the use of prontosil in obstetrics. In forty-four of the cases he had treated the haemolytic streptococcus had not been isolated, and in such cases there was no evidence that prontosil was of value. In forty cases a haemolytic streptococcus had been found; in nineteen of these in which infection was localized there were no deaths; in ten where infection involved the pelvic cellular tissue, the peritoneum, veins, tubes, or ovaries there were no deaths; but of the eleven remaining patients, showing either septicaemia or peritonitis, six died. He administered the drug prophylactically to 104 patients, in none of whom were haemolytic streptococci found, whereas in seventy-three controls this organism occurred eight times. An interesting discussion followed in which Professor JOHN CHISHOLM (Sheffield), Mr. A. GEMMELL (Liverpool), Mr. C. WALSH (Liverpool), Mr. BURNS (Liverpool), and Mr. JEFFCOTE (Liverpool) took part. At the same meeting the president, Dr. J. W. BRIDE (Manchester), discussed further a case of malignant tumour of the ovary and lung in a girl of 12. Mr. C. J. K. HAMILTON reported a case of acute yellow atrophy of the liver; Professor A. M. CLAYE (Leeds) discussed a case in which dysmenorrhoea and dyspareunia were due to endometriosis; and Mr. GEMMELL showed two pathological specimens, one of carcinoma of the isthmus uteri, the other of a sarcoma of the uterus. Finally, Mr. ST. GEORGE WILSON (Liverpool) showed, by means of a cinematograph film, a method of delivering the trunk and arms in breech presentation.

A meeting of the London Association of the Medical Women's Federation was held on December 8 at the premises of Messrs. Hazell, Watson and Viney, Long Acre, W.C., printers of the *Lancet*. Small parties were conducted round the works and inspected processes of setting up copy by monotype machines; correcting errors of composition; making-up and imposition of pages; printing; and folding, gathering, and stitching. In the course of the evening Dr. M. H. Kettle commented on some editorial aspects of the printing arrangements. Some seventy members were present. In the unavoidable absence of the president, Miss E. C. Lewis, Dr. Letitia Fairfield thanked the directors for the opportunity offered to see the *Lancet* in the making, and for their hospitality.

A clinical meeting of the Oral Surgery Club was held at Leeds on November 26 and 27, twenty-six members and guests being present. The general meeting and dinner was held in the University Staff House on November 26. The following were elected to hold office for the coming year: president, Professor T. Talmage Read; members of committee, Professor F. C. Wilkinson, Major S. H. Woods, Mr. T. Hall Felton, Mr. A. E. Rowlett, and Mr. Harold Round; honorary secretary, Mr. R. S. Taylor.

Local News

ENGLAND AND WALES

Vital Statistics for 1936

The volume of Medical Tables forming Part I of the Registrar-General's Statistical Review of England and Wales for 1936 (H.M. Stationery Office, 6s.) shows that the number of live births registered during the year was 605,292, giving a birth rate of 14.8 per 1,000 persons living. This rate was 0.1 above that for 1935, and 0.4 above that for 1933, which was the lowest ever recorded. The county having the highest rate was Durham with 17.3, followed by Staffordshire with 17.0; those with the lowest rates were Cardiganshire 11.7, Cambridgeshire 11.9, and East Sussex 11.9. The death rate was 12.1 per 1,000 persons living, 0.4 above the rate for 1935 and 0.3 above that for 1934, but 0.2 below that for 1933. When allowance is made for the fact that the average age of the living population is increasing every year, the resulting corrected or standardized death rate was 9.2, which is 0.2 above that for 1935, the lowest ever recorded both for men and for women. The mortality of infants under 1 year was 59 per 1,000 live births, which is 2 per 1,000 in excess of that for 1935, the lowest on record. Mortality from infectious and parasitic diseases in general reached a low record of 1.17 per 1,000, and the tuberculosis death rate declined once again to a new low record of 692 per million. Pneumonia mortality was 690 per million—only a slight increase on that for 1935, the lowest recorded. The measles death rate per million children under 15, which up to twenty years ago was seldom below 1,000, was 297, and the whooping-cough rate was 228. Diphtheria again registered a considerable improvement over the preceding year. The cancer rate, corrected for the increasing age of the population, increased slightly to 1,010 per million from 1,001 in the previous year. Deaths of women attributed to complications of child-bearing numbered 1.34 from septic causes and 2.31 from other puerperal causes to each 1,000 live and still births, compared with rates of 1.61 and 2.33 respectively in 1935. Resort to suicide showed a further decline, the crude rates per million persons living having fallen each year since 1932, when the high level of 143 was reached, by successive steps to 124 in 1936. Accidental deaths by fall or crushing, including traffic fatalities, increased to 306 per million, which equals the high record of 1934.

Science and Social Service

In his address on science and social service given to members of the National Institute of Industrial Psychology at Burlington House, London, on December 16, Sir Richard Gregory, Bt., editor of *Nature*, stressed the urgent need for the application of scientific method to social and international problems. Although scientific discoveries might be prostituted in the cause of war, it must be acknowledged that the advance of science had on the whole led to an enormous alleviation of human suffering and an increase in the capacity and facilities for happiness. As science was responsible for the industrial developments and economic changes which had caused violent disturbances in our social structure, and provided also the means by which civilization might commit suicide, it had a duty to guide the human race in the wise use of the powers it had created. The personal and group loyalties of men, their fears, ideals, passions, and ambitions, all lent themselves to scientific study with a view to providing a basis for effective social action. It was fashionable at the present time to blame the machine for the mechanization of life. To do this was to make the fundamental mistake of regarding the machine as the master and not the servant of society, and to forget that the most regrettable results of industrialization were not for the most part the direct fault of technological progress, but of lack of consideration for human needs. Science should be able to assist in the solution of problems arising out of the new social environment as well as in the industrial field. One of the prime needs of the present time was the development of research in the social and biological sciences on a scale commensurate with that of the physical sciences. In contrast to investigations which treated human beings as mechanical robots the primary aim of any such studies should be to increase the comfort and promote the intelligence of the worker in order to combat the evils due to conditions arising out of mechanization in industry. Most of the work of the National Institute of Industrial Psychology was designed to this end, and was thus assisting in the adjustment of society to the changes caused by technical development. In conclusion Sir Richard Gregory referred particularly to the value of the Institute's work in vocational guidance and selection.

Midwives and Cases of Contracted Pelvis

At the December meeting of the Central Midwives Board for England and Wales a letter from the Central Midwives Institute was considered. It asked for a ruling as to whether, under the existing rules, if a midwife is advised by the doctor in charge of an ante-natal clinic that her patient has a contracted pelvis and that a doctor should be engaged, the midwife is obliged to act on the advice given or whether she may decide for herself if the pelvis is contracted or not, and whether it is necessary to engage a doctor. The Board decided that a reply be sent to the Midwives Institute in the following terms:

> Except in an emergency a midwife must not, without medical aid, attend a pregnant woman or conduct a confinement if the patient is suffering from any abnormality or complication. If a midwife has been notified by a registered medical practitioner in charge of an ante-natal clinic that one of a midwife's patients has a contracted pelvis or other abnormality, and that a doctor should be responsible for the case, the midwife must act in accordance with the notification of such medical practitioner. In the opinion of the Board, any notification of the nature referred to above should be made by the medical officer in charge of the ante-natal clinic in writing, and not verbally.

Physical Education and Training

A conference on physical education and training, arranged by the London Head Mistresses' Employment Committee, was held recently at Montagu House, Whitehall, the headquarters of the Ministry of Labour. Miss E. Strudwick, High Mistress of St. Paul's Girls School and chairman of the Employment Committee, presided over a meeting of head mistresses and physical training teachers. The principal speakers were Miss D. Spafford, secretary of the Ling Physical Education Association, and Sir Henry Pelham of the National Advisory Council for Physical Training and Recreation. Other experts contributing to the discussion were Miss Colson of the Central Council for Recreative Physical Training, Miss Grant Clark of the L.C.C. College of Physical Training, and the principals of physical training colleges. Miss Spafford said the shortage of trained gymnastic teachers had been accentuated by the demand for trained organizers in all parts of the country, due to the popularity of recreative physical training. Speaking of the three years' course, she emphasized the value of the third year of training, which included a medical course and dancing. In the field of recreative physical training Miss Spafford emphasized the need for a thorough and all-round training. Miss Strudwick, referring to the demand for shorter courses of training, spoke of the danger of lowering the high standard which had been achieved by physical training colleges in the past.

Correspondence

Immunization against Typhoid

SIR,—I am in complete agreement with Professor Greenwood regarding the fallacies inherent in such statistics as those of typhoid immunization. This is especially so when the figures are compiled by medical men who are not necessarily expert statisticians. It is, however, possible to obtain a broad impression which, although not having the value of accurately compiled statistics, makes a reasonable appeal to common sense.

From the beginning of the war I had charge of the campaign against typhoid among both troops and civilians in Alsace and in some parts of the adjacent French territory. In these regions typhoid was endemic, and many cases occurred among the German troops when they were billeted in the villages. In spite of all efforts both before and after the beginning of the war—which efforts included the isolation of all bacilli carriers—typhoid continued to occur among the civil population, but not among the troops who had been vaccinated. It was therefore decided to enforce vaccination upon the civil population in a district where the disease had been prevalent for more than thirty years. After this vaccination no case of typhoid occurred in that district for the remainder of the war, and we were informed by the Civil District Medical Officer that this was the first time that this had happened. This was so much more surprising in that general conditions were much worse than during peace time.

After the war I received a grant from the Prussian Ministry of Health for the purpose of the study of oral immunization. There are two methods of oral immunization: the first is that of Besredka, where bile pills are given before the tablet of oral vaccine; and the second is that of von Wassermann and Neuberg, where sodium benzoate is used in place of the bile pill. Up till January, 1927, Besredka's method had been used in about 250,000 cases in both French territory and in Eastern Europe, good results being obtained in both places. In the town of Lodz, of 43,000 immunized people only forty-three became infected (0.1 per cent.), while among the 73,000 non-immunized people, 1,000 cases occurred (1.4 per cent.). In the last edition of his book (1937) Besredka gives further examples of the good results obtainable: 32,130 received vaccine, and there were six cases of typhoid; among 45,790 controls there were thirty-nine cases of typhoid. In an investigation carried out in Japan it was observed that in Tokyo, out of 42,094 who had received vaccine there were 229 cases of typhoid, and that out of 154,390 controls 1,624 developed typhoid; in rural districts, out of 77,810 who were given vaccine 306 subsequently developed typhoid, and in 267,109 controls there were 2,929 cases.

A report by Tchernozoubov showed that monovalent oral vaccines prepared from about 12 strains gave complete protection, no case after that occurring in three villages with populations totalling about 2,000 inhabitants. He stresses the advantage which lies in the fact that as many as 50,000 million organisms may be administered by this method, whereas no more than half this number may be injected. The fact that after oral immunization the Widal titre rises to 1:1,000 or 1:1,200 and remains as high as 1:200 or 1:400 after ten months shows that the antigenic properties are resorbed and are present in the circulation (Ruge). The method of von Wassermann was used in Germany and Jugoslavia. Hirsch (Jugoslavia) immunized 350 people by mouth, of whom not one became infected, while nine cases of typhoid occurred among 500 people of the same district who were not immunized; there were two cases among 2,000 people immunized subcutaneously. Mantey (Germany) carried out investigations in a city of 5,000 inhabitants where typhoid was endemic, and where 220 cases had occurred in four previous years. He gave oral immunization to 178 people who had been in contact with typhoid cases or carriers, but, despite this "isolation," two cases occurred among people who had not been immunized.

Apart from these examples the method was used in the Hanover outbreak in 1926, when 20,000 people were given oral immunization, but, as the method was not used until the latter part of the epidemic, no conclusions can be drawn from the protection obtained. The number included some hundreds of school children, and no complaints were received of any ill effects or reactions.

I feel that the method is worthy of trial in other instances, and that it is especially useful under the conditions of peace and among a civil population where the opposition to injection prevents the use of subcutaneous vaccination. It further avoids the inconvenience of those reactions which frequently follow the injection technique.—I am, etc.,

London, W.1, Dec. 21, 1937. ERNST M. FRAENKEL.

Periodicity of Recurrences in Cancer

SIR,—The theory of a thirty-three-week cycle in epidemics of influenza, advanced by Brownlee and by Stallybrass, has been found useful in forecasting epidemics. Its essential nature, however, remains undetermined, possibly depending on some life-cycle of the causal virus. Many writers have pointed out that exacerbations of malignant disease often follow attacks of influenza, tonsillitis, etc., but so far as I know no periodicity has been reported in recurrences of malignancy. The following observations suggest, however, that this does occur in breast cancer in thirty-three-week cycles.

In twelve patients (private cases) with breast cancer who have been followed up carefully at intervals of one to three months (some for periods of four or more years) recurrences have been noted at thirty-three-week intervals. In one patient four such periods have been observed with recurrence of nodules in the scar and metastases in the opposite breast and axilla. In twenty hospital patients in one series examined the same phenomenon was apparent in primary, recurrent, and metastatic cases. Most patients showing "cyclical or intrinsic periodicity" (Stallybrass, C. O., *Principles of Epidemiology*, 1931, p. 570) clearly had a thirty-three-week cycle, sometimes singly, or in longer periods with two to nine cycles between the appearance of recurrences. Thus two-year periods of intermission were occasionally noted—that is, three intervals of thirty-three weeks.

A similar periodicity of seven and a half to eight months has been traced in thirty other cases of cancer in other sites—for example, skin, lip, cheek, palate, tongue, pharynx, larynx, oesophagus, and testicle. A preliminary survey shows a great majority of recurrences at this interval. Also in the allied diseases, Hodgkin's disease and leukaemia, several instances have been found in the few cases tested. One patient with Mikulicz's disease had three periods.

Periodicity is a phenomenon of recurrence and cannot be found either in patients rapidly cured, in those dying soon with a highly virulent invasion, or in those with very low resistance. Further points for study are the

relation of irradiation to periodicity: as to altering its spacing or not, as to radiosensitiveness at stages of a period, and as to the possible value of prophylactic irradiation (local or general) just before a probable period of recurrence. Clinical examination would appear to be most necessary at and about the periods of maximal growth activity, as the earliest recurrences respond most satisfactorily to treatment. Periodicity might be studied with advantage to our knowledge in those few patients who refuse all medical treatment, for about untreated cases little is known so far but the average duration of life. Biochemical research at maximal periods might yield valuable results.

As to explanations of periodicity the most probable appears to be that it supports the virus theory of cancer. I have lately discussed some of the evidence in favour of it (*Brit. J. Radiol.*, 1937, **10**, 529), such as contagion and possible association with other virus diseases. If periodicity be established as part of the natural history of tumours it would appear to support the virus theory of their origin: the dates so far assembled appear to be random ones, not following the influenza maxima, as the alternative explanation of a lowered resistance to malignancy resulting from influenzal infection (manifest or latent) would seem to imply. Detailed statistics will be published in due course. The study of periodicity may be expected to throw new light on the cancer problem from the points of view of the clinician, the medical statistician, and the pathologist.—I am, etc.,

J. H. DOUGLAS WEBSTER, M.D., F.R.C.P.Ed.,
Honorary Director, Meyerstein Institute of Radiotherapy, Middlesex Hospital.
London, W.1, Dec. 21, 1937.

Lipoids and Cancer

SIR,—In an annotation in the *Journal* of December 18 (p. 1229) on the nature of the Rous agent, you draw attention to the work of Jobling, Sproul, and Stevens, who have successfully obtained from the Rous tumours active carcinogenic extracts, which contain very little proteid or carbohydrates, but consist mostly of lipoids, and you question whether these facts have any relation to the chemical structure of known carcinogenic compounds.

That lipoids are in some way associated with the onset of malignant disease has been suggested from time to time—for instance, Cronin Lowe, in discussing the Bendien reaction, has pointed out the deficiency of the lipolytic power of the serum, and Shaw MacKenzie has done some valuable work in this connexion. But we have not advanced much further. It seems to me that in cancer there is a disturbance of the lipoid metabolism, which brings about an alteration in the surface tension of the cells, causing them to proliferate unduly. It is in this alteration of surface tension that the mysteries of the division of the cells and nuclei lie. In mitosis and after fertilization the protoplasm becomes converted to a more or less jelly state; this change is always an indication of activity. I believe that in cancer there is in the serum and tissues an excess of non-saturated fatty acids or of alkalis, or perhaps of both, and these combine to form saponins, which have a profound effect on surface tension. Indeed, it is known that such an increase in fatty acids does occur, the percentage rising from 62.1 in health to 72.62 in cases of cancer. According to W. E. Dixon, the key to the understanding of the action of the saponins lies in their behaviour to cholesterin and lecithin, with which they combine in equimolecular amounts; the lipoids of the cells are then changed physically and chemically and lose their functions. Thus the lipoid membrane of the red blood cells loses its power of retaining the viscous haemoglobin, which passes out of the stroma. Have we not here an explanation of what occurs in pernicious anaemia which is successfully treated by the exhibition of the liver esterases, with their action on fatty acids? There is no doubt that the cohesion of protoplasm is due to the fats present, and anything affecting this cohesion causes an alteration in the physical state of the cells, and thereby an alteration of surface tension.

Cholesterol exists in the body combined with fatty acids as esters, which in health are split, dissolved, and hydrolysed by the esterases of the bile, duodenum, and pancreas (Thamhauser). From esters it is not a far step to the production of carcinogenic bodies. All that is required is their dehydrogenation by a faulty mechanism, and we know that in cancer there is a diminution in body acidity; we also know from the experiments of Loeb, B. Moore, and others that an increase in alkalinity stimulates, and an increase in acidity depresses, manifestations of cell life. Dehydrogenation of esters may be explained by this statement of B. Moore: "It is clear that the rate of production of acids, other things being equal, must depend on the concentration of hydrogen ions in the plasma. A drop from any cause of hydrogen ions in the plasma must mean a corresponding fall in the rate of production of acids."

There are, then, five conclusions: (1) cell division is affected by an alteration in the surface tension; (2) faulty metabolism of lipoids causes an alteration of surface tension, most probably from the formation of soaps; (3) diminished acidity stimulates growth; (4) in cancer there occurs diminished acidity due to a drop in the hydrogen ions of the plasma; and (5) dehydrogenation of esters causes them to become carcinogenic.—I am, etc.,

Wigan, Dec. 22, 1937. J. THOMSON SHIRLAW.

Treatment of Psychoneuroses

SIR,—As the essence of psychoneuroses is an emotion preventing a due adjustment of circumstance, then in order to get rid of it the means of its induction must be sought. The principle of their conditioning in human beings does not differ from that used by Pavlov in dogs, where by artificial stimuli he produced in the animals a state of expectation of food which led to the physiological reactions normally set up by its presence. Similarly he showed how to induce by an artificial stimulus the physiological consequences of such an incommoding emotion as fear, which with human beings is the most frequent emotional factor in psychoneuroses, whether expressed as specific phobia, general anxiety, obsessive thinking, sense of inadequacy, faulty interpretations, excessive rationalizations, or even some mannerisms. In the dog a reorientation of attitude towards the artificial stimulus reconditions its effects, so that a sound that had produced the tremor of fear will now produce salivation and pleasure of food expected.

Psychotherapy is essentially a reconditioning on this principle. It is reorientation of a patient's attitude, so that stimuli which had made him uncomfortable become indifferent or pleasurable. The more simply this is attempted the less time it takes. Indeed, when a single external situation provokes a phobia, paralysis, anaesthesia, mutism, an emotional crisis, or what not, reconditioning may require only one interview. But it will seldom be permanent, unless the patient learns the rationale of the process whereby his life attitude is reset.

The lucubration of his readaptation may go on for weeks without further intervention of the psychotherapist, who should never adopt the role of priest, but assume that of a fellow searcher, who does not impose upon him but draws out potentialities for autochthonous development. For the human psyche is not a static automaton, but a dynamism for illimitable adjustment to ever-changing circumstance. For, however standardized and automatic become the processes of industry, there always remains the difficult problem of social adjustment, demanding a complex selectivity, the failure of which is the most fertile source of psychoneuroses even in industrial relations, as has been shown by Elton Mayo in America and by Charles Myers and his co-workers in England.

That the patient must learn to understand thoroughly the inner processes of his mind excludes from psychotherapy the claims of the cults, medical or lay, which appeal esoterically or by side-tracking the real issue by substituting for it a panacea. Equally barred is suggestion, the most rapid method of all, the essence of which is that the patient does not understand the process. Enlightenment is the prime essential if fresh stimuli, unavoidable in ordinary life, are to be evaluated correctly. For example, in a kleptomaniac seen last month a single interview sufficed for ascertaining that the patient stole because of a resentment against a world which had crippled him by stealing from him. The irresistible impulsion to steal ceased with his reorientation towards its cause; whereas appeals to prudence and morality had led only to an attempt at suicide.

In thirty years' practice of psychotherapy I have encountered only four cases which approached the large number of hours assumed necessary by your correspondent Dr. Fretson Skinner (December 11, p. 1196).

> The first case, nearly thirty years ago—an anxiety hysteria due to marital maladjustment—was under treatment for two years, owing entirely to my own lack of experience and blundering. The second, a writer's cramp, required six months. Each of these patients was sent away for a long change during treatment, however, so that in neither did it actually consume over twenty hours. The third was a case of paranoidal interpretations, despair, drug and alcohol addiction, and a determined attempt at suicide. Reorientation was effected by daily interviews for six weeks—about fifty hours. This 30-year-old failure is now embarked on a successful career. The fourth, a 60-year-old woman with paranoidal attitudes, was seen about five times a week for nearly six months. She has remained well for six years.

These are conspicuous exceptions, for the usual patient seldom needs more than a week or two for permanent reorientation, and seldom requires as much as five hours of actual psychotherapy. I know of only one relapse, and that occurred after fifteen years of successful professional life.

The aim at the essentials of reconditioning avoids time-consuming and seldom advantageous free association, dream analysis, the bedevilment of a supposed sexual origin except when present, the seeking for non-existing repressions except when there, and all reference to a hypothetical unconscious and suchlike red herrings, which obscure the issue, waste hours, and mystify the patient and often doctor also, when they are not mere devices for the deep anamnesis necessary to penetrate the inner psyche of the patient.

Neither Faculties nor practitioners can be blamed for scepticism towards methods which claim esoteric exclusiveness, such as requiring that an exponent be psychoanalysed by Freud. It is significant, too, that the leading English-speaking advocate of that form of psycho-analysis, Dr. Brill of New York, confessed before the American Psychiatric Association in 1926 that it cured few even of the small number of psychoneurotics who should be psycho-analysed. This was in marked contrast to the claims of himself and others in 1901, after the introduction of the method to America—that all psychoneurotics were curable by this method, and by this method only.—I am, etc.,

Bordighera, Dec. 18, 1937. TOM A. WILLIAMS.

SIR,—I was greatly heartened to see two letters on this subject in the *Journal* to-day, particularly when they are written by such well-known authorities as Dr. Ross and Dr. Rees. Perhaps I may be pardoned for a little loose exaggeration in my effort to state some of the difficulties I have personally met with in the treatment of psychoneurotic cases.

I have neither the skill nor the experience of Dr. Ross, whose pioneer work is known and valued by all who are interested in this subject, and the last thing I wish is to create discussion on the methods of treatment or schools of thought. I should have said there are "not many guide-posts" rather than "not any." But my point was that most medical men are sent out from the schools without much knowledge as to the whereabouts of these guide-posts, and without the skill to read them when they are met with.

It must, of course, be true that many cases of the milder types of psychoneurosis *do* get well in less time than I mentioned. Every medical man uses his personality in treating his patients, and those neurotics who get well do so because of the "unconscious psychotherapy" employed by the hard-worked doctor. It was not of these cases I was writing, but of the more serious cases that constitute such a difficult group. For example, the anxiety states seen in miners form a very big group of cases in my clinic. These men are truly pitiable, in that they really want to return to work but cannot do so on account of their anxiety, seen under its varying symptomatology. Then again there is the group of "difficult youths" who are unable to find an occupational niche. This is the result of the economic stress during the "slump" period, which produced a home environment which, in spite of brave and gallant endeavours to prevent it, tends to lead to childish reaction character traits and psychoneurotic disorders. It is these groups among others that form such a difficult problem in big industrial cities like Sheffield. To quote Dr. Ross himself (*The Common Neuroses*):

> "Such a patient if taken on at all must be taken seriously; the first interview is one of the most important of all, and if a patient turns up with the symptoms which suggest the presence of a functional state and the doctor is pressed for time, he should defer the taking of the case *till he has at least a full hour to spare*." (Italics mine.)

This is exactly the difficulty I tried to stress. To wait for a full hour for six patients seen on the one day a week devoted to the clinic means setting aside six hours during the week for these people. To give them only six interviews is to spend thirty-six hours over six patients, and meanwhile there are another six new patients each week to be similarly dealt with. It is merely a matter of arithmetic to see that a waiting list very soon becomes choked.

I think the suggestion put forward by Dr. Rees—namely, that of a special committee to be set up by the B.M.A.—is worthy of the closest consideration.—I am, etc.,

Sheffield, Dec. 18, 1937. E. FRETSON SKINNER.

Autophytic Dermatitis

SIR,—The able and authoritative article by Dr. Henry MacCormac in the *Journal* of December 11 has induced me to call attention to an allied, but somewhat different, form of autophytic dermatitis. In those cases the injury inflicted on the skin is not intentional but autonomous. It may be done at times of stress or agitation, or it may be a habit of which the patient is unaware, but in any case it often results in a dermatitis produced by touching or rubbing the skin by a restless moving finger, or the conveyance of a superficial infection from one part of the body to another by the same agency.

A middle-aged lady with erythema of the face, while talking in the course of her consultation, could be seen constantly touching her face with one or other hand. She was quite unconscious of doing so, and even when she was told about it did not desist until her hands were held. When the habit was controlled the skin healed.

As an instance of the conveyance of infection by the restless finger, a case occurred where it seemed likely that a Monilia infection between the toes had something to do with the starting of a pruritus ani.

Such involuntary actions might, I suppose, be termed "release phenomena" by the psychologists.—I am, etc.,

Rothesay, Dec. 17, 1937. J. N. MARSHALL.

Strangulation of Herniated Ovary

SIR,—I have been much interested in the letters recently published in the *Journal* (August 7, p. 265; November 27, p. 1102; and December 4, p. 1152) on this subject.

Inguinal hernia in female children is rare in all who are adequately fed and whose diet is well managed. In other words, it is rare in those who are plump, contented, and happy; more common in those who are thin and cry continually from indigestion, or who strain when their bowels act. Rickets, which balloons out the intestine, predisposes markedly to hernia. The absorption of fat lays bare the internal ring and takes all the "stuffing" out of the canal. Crying and straining raise the intra-abdominal pressure enormously, while rickets expands, and therefore thins out, the abdominal wall. The role of the gubernaculum and the canal of Nuck is important, but I think a good deal of rubbish is written about it. How the gubernaculum can pull the testis to the bottom of the scrotum, when the scrotum is not a fixed point, and not pull the bottom of the scrotum up to the external abdominal ring, I can never understand, but I can believe that it pulls or anchors the genital organ, testis or ovary, at the brim of the true pelvis quite near the internal ring. Having reached this spot it requires very little excursion to enter into the canal or fall over into the pelvis. For some weeks after birth the testicles can easily be withdrawn into the abdominal cavity if the inner part of the thigh be touched. In much the same way, I think, the ovaries might be made to descend along the inguinal canal if they could be manipulated. I conducted an investigation on small babies, and examined post mortem the inguinal region of about 150. In no case was the peritoneum attached to the abdominal wall in any way, and it was invaginated, by a probe, along the inguinal canal to the external ring. The descent of the ovary may be comparatively rare, but when it occurs there is always danger of strangulation taking place, not so much if it is left alone but after well-meaning efforts at taxis.

I used to teach students that all strangulated herniae in baby girls of less than 3 months old contained ovary and not bowel. Strangulation of gut in female children at this time is excessively rare. The reason for this is obvious, for if the bowel comes down the neck of the sac is expanded over the entering and returning portion of the gut, as well as the omentum between the two tubes. It has therefore a more or less pyramidal shape which favours replacement. The ovary, on the other hand, once down, is in the position of a button through a buttonhole; it has a narrow neck and is extremely difficult to replace, but often if left alone will go back by itself. If ordinary taxis is applied by anyone who fails to recognize what the contents of the hernia are, strangulation is quite likely to follow.

The prolapsed ovary overlies the external ring, and if pushed upwards and outwards, as in ordinary taxis, is pushed over the narrowest part of the ring just at the bifurcation of the two pillars where the chance of replacement is smallest. Continual pressure or persistence in taxis will injure the ovary, swelling takes place, and incarceration and strangulation may start in the ordinary way. Taxis, to be successful in the case of the ovary, must be made in exactly the opposite direction to ordinary taxis; in other words, the ovary must be gently pressed downwards and inwards to the pubic spine over the widest part of the ring, so that the button will the more easily go through the buttonhole. I have demonstrated this, and felt the ovary suddenly disappear as if snatched away, so often that I am sure of the truth of this observation.

From the letters in the *Journal* I gather that the probability of an ovary being in a strangulated hernia of a female infant needs emphasizing, and the true method of replacing it needs to be taught.—I am, etc.,

DUNCAN C. L. FITZWILLIAMS,
London, W.1, Dec. 22, 1937. C.M.G., M.D., F.R.C.S.

Rupture of the Aorta

SIR,—In the *Journal* of November 13 (p. 966) Miss Constance Ottley describes a case of this condition. It may be of interest to record a similar one.

On June 25, 1933, a married woman, aged 37, was admitted to the Military Families Hospital, Tidworth, as a stretcher case. On the morning of the previous day she felt unusually well, and had proceeded to carry out a "large washing." About midday, when she had almost finished her work, she was suddenly seized with a violent pain in the chest and back, which caused her to cry out. She stated that just before the pain came on she experienced a feeling that something had given way in her chest and the right side of her neck. On this point she was quite clear and volunteered the information. She was able to walk into the back yard to summon help. The patient was seen by Captain Bayley, R.A.M.C., shortly afterwards. His report stated that she was pale, but that the pulse was slow and regular. There was no dyspnoea. She passed a somewhat restless night, and was admitted to hospital at 12.30 p.m. the following day. She was then somewhat pale, but her appearance did not suggest that she was gravely ill. The pulse was slow and regular, the temperature was 99° F., and the blood pressure was 130/80 mm. Hg. There was no evidence of cardiac enlargement; a systolic murmur was heard over the base of the heart. The radial pulses were equal in volume, and the pupils were equal. The patient complained of pain in the centre of the chest which radiated to the back and the right side of the neck. She was quite clear in her mind, and spoke without difficulty. A possible rupture of an aortic valve was considered, and an injection of 1/8 grain of morphine was administered. She became more comfortable and dozed. At 3.40 p.m. she was suddenly cyanosed and died immediately.

At necropsy the pericardial sac was distended with blood and the aorta atheromatous. About one and a half inches above

the aortic valves there was a vertical tear about half an inch long through an atheromatous patch. The coats of the aorta were separated to form a dissecting aneurysm, and from this there was an opening into the pericardial sac. The heart was not enlarged, and the other organs of the body appeared to be normal.

In both Miss Ottley's case and my own sudden pain was experienced. In the former it was referred to the epigastrium, in the latter to the chest, and in both cases it radiated to the back. My patient had the definite feeling that something had given way; this does not appear to have been experienced by Miss Ottley's case. Both patients were pale, in both the pulse was regular and slow and the blood pressure readings similar. In both cases a primary rupture took place forming a dissecting aneurysm, which was followed by the secondary rupture, in Miss Ottley's case in some seven hours' time and in mine in about twenty-seven hours. Both were married women, Miss Ottley's patient being 63 and mine twenty-six years younger.

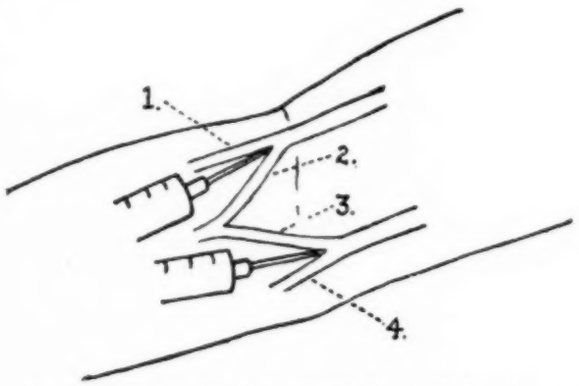
I am indebted to Lieutenant-General Sir James A. Hartigan, Director-General, Army Medical Services, for permission to publish these notes.

—I am, etc.,

London, E.4, Dec. 13, 1937. R. W. SWAYNE, M.B., B.S.

An Easy Method of Venepuncture

SIR,—Two of the commonest difficulties encountered in venepuncture are complete transfixion of the vein and the excessive mobility which accounts for the failure to enter it. These difficulties are met with especially by practitioners who have to do only a few venepunctures a year.



1.—Superficial radial vein. (2) Median cephalic vein. 3.—Median basilic vein. 4.—Superficial ulnar vein.

To overcome them I have devised the following technique, which I have used in a large number of cases with complete success, even where the veins have been very small. The prihciple of the method is to aim at the angle formed by the junction of two veins—that of the superficial radial and the median cephalic, that of the median basilic and the superficial ulnar, or any other junction which may present itself about the elbow-joint. By this technique slipping is prevented; the chances of entering a vein are greatly increased, as there is one on each side of the needle; and the danger of going through the vein is minimized. I have found this method particularly valuable in taking blood from donors for transfusion.—I am, etc.,

LÉON FEINSON-MULDAVIN,
Royal Free Hospital, London. Senior Casualty Officer.
Dec. 16, 1937.

Ether Convulsions

SIR,—Mr. J. B. Bamford's comments on this subject in the *Journal* of December 18 (p. 1252) have reminded me that I had three cases of so-called ether convulsions when I was an anaesthetist to several of the smaller London hospitals thirty-five years ago. My colleagues called it ether convulsions, but I did not agree with them, as all the three cases were not completely anaesthetized when the convulsions occurred, and on changing over to chloroform, which in those days was not considered a safe procedure, the convulsions ceased and the operation was completed.

Afterwards I went carefully into the patients' histories, and found that they had all three suffered from *petit mal*. It is, I think, accepted that these patients take ether very badly but chloroform well. It would be of interest to hear if Mr. Bamford had also considered this point before coming to the conclusion that his four cases were really suffering from ether convulsions.—I am, etc.,

Chichester, Dec. 20, 1937. A. M. BARFORD.

The Problem of the Final M.B., B.S.Lond.

SIR,—Dr. A. M. H. Gray's natural modesty did not allow him to give a complete view of transactions in which he has played an important part. Some years ago the Board of the Faculty of Medicine appointed a committee to report to it on medical grievances. This committee advised the Board to ask the Senate to authorize a full inquiry into the university curriculum. This proposal seemed, however, inadequate. Viscount Dawson, I think, exhorted the Board to take a wider view, to remember that the ancient universities of Oxford and Cambridge sent their medical students to London, and urged that it would be more statesmanlike if the three universities—and the Royal Colleges—took council together. This view commended itself to the Board. The late Professor Pembrey did indeed object that the Colleges, not being universities, should not be included, but he was in a minority of one, and the logical defect he pointed out was thought to have been cured by associating the Society of Apothecaries (a body which had examined general practitioners long before the Royal College of Physicians could so far condescend) with the inquiry. An expert committee was constituted, took evidence, and reported. The report was adopted in principle by the Senate, which instructed its chain of subordinate academic committees to revise the scheme of medical teaching and examination in London accordingly. This elaborate process was completed about thirteen months ago, and all seemed to be ready for the trial of a new system.

But the Board of the Faculty could wait no longer, the scandal was *too* gross; perhaps the Universities of Oxford and Cambridge, the Royal Colleges, and the Society of Apothecaries, excellent in isolation, were bad in combination; perhaps these new regulations, so painfully elaborated, would not cure the evil. What was to be done? Recalling the ancient truth that the half is sometimes greater than the whole, the Board decided to forsake the Universities of Oxford and Cambridge (and the Society of Apothecaries) and take refuge in the arms of the Royal Colleges.

It may be asked what these *corporations*, as distinct from those of their individual members who are teachers of the *university*, have to contribute to the solution of an educational problem. They do not represent the general practitioners of the country; their only corporate relation with general practitioners is by virtue of the fact that they

examine and license many, at a profit of £16,000 a year. It may be that the President of the Royal College of Physicians has wisdom to impart to a Viscount Dawson of Penn who is a representative of the Faculty of Medicine on the University Senate. It is just possible that the wisdom of Dr. Gray, a member of the President's Advisory Committee, will mellow the fiery eloquence of Dr. Gray, a senator of the University. But these seem rather metaphysical arguments. Until something more solid is produced, the Graduates' Association will not be alone in viewing with suspicion the gyrations of the Board of the Faculty of Medicine.—I am, etc.,

Loughton, Dec. 27, 1937. MAJOR GREENWOOD.

Applying for Hospital Posts

SIR,—I am sure that everyone who has applied for a post on the honorary staff of a hospital will agree wholeheartedly with Mr. Kenneth Walker. Most of these elections involve a tremendous waste of time, particularly for the candidates. Personally I bitterly regret the hours which I have wasted in calling upon electors. It is high time that a committee was appointed to look into the whole system, with particular reference to the wording of the advertisements which invite application.

At the Cook County Hospital, Chicago, election to the staff is by examination conducted by an impartial body drawn from all parts of America save Chicago, and the appointment is for seven years. At the end of seven years every member of the staff must re-enter into open competition. Such a system has obvious advantages, both to the hospital and to the staff as a whole. In my opinion this is the fairest and most efficient system of election that has yet been devised.

The seven-yearly examination has recently taken place, and it might interest your readers to see the surgical paper.

CIVIL SERVICE COMMISSION OF COOK COUNTY
ORIGINAL ENTRANCE EXAMINATION—No. 1471
ATTENDING STAFF—COOK COUNTY HOSPITAL
SURGERY
Class A. *Rank 2.* *Grade I.*
Special Subject: Weight 5.

1. Discuss the types, symptoms, and treatment of diaphragmatic hernia.
2. Discuss appendicitis in children.
3. Discuss the actiology, symptoms, complications, and treatment of gastro-jejunal ulcer.
4. Give the indications for exploration of the common bile duct during operations on the biliary system.
5. Discuss "water balance" and the methods to maintain it post-operatively.
6. Discuss causes, diagnosis, and treatment of palmar abscess.
7. Differentiate as to diagnosis and treatment between mechanical and paralytic ileus.
8. Give the symptoms, pathologic physiology, and treatment of a traumatic fistula between the femoral artery and vein at the level of Hunter's canal.
9. Discuss malignancies of the thyroid gland.
10. Discuss the symptoms, diagnosis, and treatment of carcinoma of the right colon.

—I am, etc.,

London, W.1, Dec. 17, 1937. HAMILTON BAILEY.

West London Post-Graduate College

SIR,—I am sure that all my colleagues at the West London Hospital would wish me to thank your correspondent, "Postgraduate" (December 18, p. 1251) for his generous tribute to the value of the work of the West London Post-Graduate College. We share his regrets at the prospect of its passing, although these regrets are to some extent softened by the birth of the new medical school which is to take its place.

If "Postgraduate" will read the detailed account of the history of the new school which appeared in the *British Medical Journal* on December 4 (p. 1124) he will appreciate that our policy has been largely forced upon us by circumstances outside our control. When the British Postgraduate Medical School was in process of formation some ten years ago it seemed natural that it should be established at the hospital which had, for thirty years, devoted itself exclusively to this branch of medical education. The School was, in fact, offered to the West London Hospital and the offer was accepted. Some months later the offer was withdrawn, to the detriment of our Hospital and College, as was fully explained in your article to which reference has been made.

In 1934 the new Postgraduate School, which had originally been promised to us, was about to open almost on our doorstep. Staffed by men of the greatest eminence and equipped and maintained by the unlimited resources of the State, the British Postgraduate Medical School seemed a grave menace to the future of the West London College, whose income was derived solely from students' fees and whose staff consisted of busy consultants with only limited time available for teaching purposes.

Our present action is therefore the natural outcome of past events. Although many thousands of postgraduate students from all parts of Great Britain, the Empire, and foreign countries have passed through our college no official encouragement or recognition was forthcoming until the idea of the British Postgraduate Medical School began to mature. The fulfilment of that scheme, at first so full of hope for the West London, ended by threatening the very existence of its College. In self-defence we had to consider other spheres of educational service, as we fully realized the great value to a hospital of some form of teaching activity.

"Postgraduate" asks why the West London should be chosen for the new medical school. If the need for a new undergraduate school is admitted, there could be no better argument in favour of its present location than his own flattering comments on the work of our Post-Graduate College. The establishment of a new school at a hospital without teaching experience or traditions would offer great difficulties, and, just as the West London once seemed the obvious place for the official Postgraduate School, so now its destiny seems to point no less clearly to a future of undergraduate teaching.

I do not think it is either practicable or advisable to teach graduates and undergraduates in the same institution unless entirely separate classes can be organized, and this would be impossible at a hospital of the size of the West London, and of which the clinical staff are all engaged in private practice. When the number of undergraduate students has increased to a substantial figure—and the applications indicate that this may be sooner than we once thought—it will be necessary at first to limit the entries of graduates and finally to exclude them altogether.

But is not "Postgraduate" taking an unduly pessimistic view of the future of graduate students in London? Surely the British Postgraduate Medical School at Ducane Road, in whose favour we are, in effect, retiring, can carry on our work with even greater efficiency. They have both a larger hospital and a larger staff—with the advantage that the latter are mostly devoting their whole time to the service of the School. Our annual number of students is rarely more than 250, and it would be very surprising if this relatively small number could not be adequately dealt with at Ducane Road. And, in spite

of your correspondent's much-appreciated testimonial to the high standard of the West London Hospital teaching, it is hard to believe that an institution with such a large and experienced staff, and upon which so much public money has been spent, could not give even greater value to medical graduates in the future than has been possible at the West London in the past.—I am, etc.,

London, W., Dec. 18, 1937. MAURICE SHAW, Dean, West London Hospital Medical School.

Who Owns X-Ray Negatives?

SIR,—The paragraph from your Paris correspondent in the *Journal* of December 18 (p. 1246) raises this question again, and I am not aware of any definite judicial decision having been declared in this country as to whether ownership vests in the radiologist, the general practitioner, or the patient.

Unfortunately, radiologists are not uniform in their procedure, and it is conceivable that the looseness observed may create difficulty in the future if and when the opinions of the courts are sought by some zealous patient. For example, some radiologists send their films and report to the general practitioner without any intimation concerning the ownership or any request for return. The practitioner, equally careless, passes them on to the patient. In other instances the practitioner retains the films as part of the confidential report supplied by the radiologist, and also for his protection in the event of any litigation ensuing. Again, in some cases the radiologist will send a film direct to the patient without making any express contract stating in whom the ownership vests.

The importance of some uniformity in procedure is obvious, and it would strengthen the radiologist's position materially if the custom were established of supplying only the patient's medical adviser with the film and report, and intimating that possession vests in him, the radiologist.

The radiologist, like the biochemist and the bacteriologist, and possibly others in a team, contributes his skill as an aid to diagnosis, and it is the opinion based upon such skill and knowledge alone for which payment is made, and not anything tangible such as a mere photograph. It must nevertheless be clear that the non-medical radiographer who receives an order direct from a person merely to take a photograph of some particular region, and not a request to make a diagnosis, is an entirely different proposition. Here it may be held that payment is made just for work done in producing an *x*-ray film or print, and not for the expert professional opinion expressed in a report, which is based upon the technical interpretation of a skilled medical radiologist.—I am, etc.,

Bournemouth, Dec. 20, 1937. WALTER ASTEN.

*** The question of ownership of *x*-ray films was discussed in the *Journal* of January 13, 1934, by a medico-legal correspondent, who was unable to trace any English legal decision on this point. He quoted three cases in the United States in which judgment had been given against a patient. In one of these it was decided that the films in dispute had no intrinsic value, and the court found that it was customary for the physician to retain the films as part of the records. Our correspondent said: "The point that the films had no intrinsic value seems sound as expressing the view that the patient pays for service and skill only." In one of the other cases, in which the patient had refused to pay a hospital bill unless the films were delivered to him, the court held that the patients bought and the hospital sold knowledge and experience, not the material of an *x*-ray film, which was the property of the hospital. This and other medico-legal articles which had appeared in these columns were published in book form by Edward Arnold and Co., under the title of *Legal Problems in Medical Practice*, by D. Harcourt Kitchin.—ED., *B.M.J.*

Auguste Forel and His Work

SIR,—I am sorry Dr. J. D. Rolleston disapproves so strongly of my review of Auguste Forel's autobiography. I tried to convey something of the vivid personality of the man as revealed therein, of the way in which he overcame early repressions and later opposition. I thought this would be more interesting to your readers than a list of laudatory references such as is contained in Dr. Rolleston's letter. Can I fairly be accused of failing to appreciate the greatness of Forel in writing such sentences as: "From a series of valuable observations on the structure and functions of the brain he was led to take up psychiatry, in which he made a name so soon that at the early age of 31, etc."; "a practical reformer achieving useful results"; "a single-minded fighter to the last for the truth as he saw it"; "his best memorial will be his work for psychiatry"? My "few slighting words" on his campaign against alcoholism are, presumably, "he never seemed to think that alcoholism was a symptom—for him it was a prime cause." Surely alcoholism is generally regarded to-day as a symptom of psychological or social disorder? I apologize for calling Forel a Bolshevist and will substitute anti-Tsarist. As for omitting any reference to his cerebral thrombosis, I put one into my original draft but cut it out for reasons of space. It is impossible to give a complete summary of a long and full life in the compass of a review. One must select those aspects which one found interesting and thinks may interest others. No two readers will see a pen portrait exactly alike. I might even disagree with the review Dr. Rolleston would have written; but I would assure him, on this appropriate date, that I had no intention of depreciating a great man whose work I have admired but of whose personality I was unaware until revealed by himself.—I am, etc.,

London, W., Dec. 25, 1937. YOUR REVIEWER.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

THIRD M.B.—*Part I* (*Surgery, Midwifery, and Gynaecology*): J. Arnott, J. L. W. Ball, C. H. Bartlett, A. H. Baynes, J. R. Bignall, G. Bourne, R. I. C. Bradford, B. R. Bray, R. W. W. Brown, L. H. Cane, D. M. Carding, I. C. Chopra, M. J. Clow, J. Clutton-Brock, P. C. Conran, E. Cronin, A. J. Daly, E. B. Davies, C. H. C. Dent, A. P. Dick, W. D. Doey, K. W. Donald, G. W. N. Dunn, N. B. Eastwood, T. A. W. Edwards, G. P. Fox, E. K. Gardner, O. D. Gilmore, M. H. Harmer, W. J. Hay, J. S. Heller, H. G. W. Hoare, R. D. Holloway, G. N. Hunt, H. M. James, R. M. Johnstone, E. P. Jowett, P. A. Knill Jones, J. Laughlin, J. W. Lillico, G. M. Little, A. G. Marshall, B. E. Miles, R. O. Murray, J. C. B. Nesfield, G. F. Panton, J. S. Phillpotts, J. G. B. Platts, B. H. Price, J. S. Prichard, G. C. Pritchard, J. H. B. Round, D. Russell-Davis, J. Smith, P. M. Smythe, H. Stott, J. Sutcliffe, R. J. D. Temple, J. R. T. Turner, A. J. Walton, J. M. Watson, H. F. Whalley, D. O. Wharton, B. D. Whitworth, E. H. L. Wigram, M. M. Wilson, J. W. Wood, P. J. Wormald, G. M. Wright, J. Yudkin. *Woman:* A. C. Clark. *Part II* (*Principles and Practice of Physic, Pathology, and Pharmacology*): G. E. Adkins, D. A. P. Anderson, T. L. Barbour, C. F. Barwell, R. D. I. Beggs, A. S. Bookless, A. W. Box, J. B. Bunting, G. A. Burfield, A. L. Cochrane, S. B. Darbishire, J. K. Denham, W. D. Doey, E. W. Dorrell, L. C. de R. Epps,

T. J. Fairbank, A. L. Fawdry, W. Goulstone, J. L. Griffith, E. B. Hacking, S. W. G. Hargrove, F. E. S. Hatfield, H. G. W. Hoare, J. H. S. Hopkins, C. W. Hutt, R. T. Johnson, H. S. Kellett, G. J. G. King, A. P. Kitchin, J. I. H. Laurie, S. A. H. Lesser, R. W. Mason, R. M. Miller, K. S. Mullard, T. L. Oliver, B. G. Parsons-Smith, G. R. C. Peatfield, P. A. T. Phibbs, A. L. Phillips, H. L. Porter, C. G. Rob, D. Rubin, G. Sheers, J. Sutcliffe, R. D. Teare, D. J. D. Torrens, R. L. Townsend, R. C. H. Tripp, S. C. Truelove, N. Vere-Hodge, J. H. Ward, S. R. F. Whittaker, J. M. G. Wilson, M. C. Woodhouse, G. H. Wooler, J. D. Younghusband. *Woman:* V. E. A. Sykes.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN CLINICAL PATHOLOGY.—Tatjana von Haebler.

EXTERNAL DIPLOMA IN CLINICAL PATHOLOGY.—C. E. W. Hoar.

UNIVERSITY OF DURHAM

KING'S COLLEGE, NEWCASTLE

Dr. S. Thompson has been appointed Lecturer in Skin Diseases in place of Sir Robert Bolam, who has resigned.

UNIVERSITY OF LEEDS

The Council of the University has appointed Dr. Geoffrey Holmes to a newly instituted honorary Lectureship in Medical Hydrology.

Dr. Charles Ludwig has been appointed to a Demonstratorship in Physiology.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—*Part II:* R. F. Ball, Gretel Bergheimer, G. Berry, Hilda Brice, C. D. Coe, D. B. H. Dawson, D. Jackson, T. H. Lawton, G. B. Locke, N. J. de V. Mather, Mary A. Rogerson, D. A. Fletcher Shaw, E. P. Whitaker, A. B. White, J. H. Wilding. *Part I:* P. N. Holmes, D. N. Kiff, Constance M. F. Lyth, J. C. Ramsden, J. F. Rickards, H. E. Thackray.

THIRD M.B., CH.B.—*Pathology and Bacteriology:* A. P. Bates, D. Bolchover, Irene M. Bower, J. B. Brownlie, Frances M. Bullough, R. Cocker, G. R. Crawshaw, Olive I. E. Elkin, Barbara H. Fiddian, *Mary Fleure, R. T. Grime, Joan Halstead, C. Hamwee, P. Haslam, J. E. Horrocks, Hannah Horton, W. L. R. Kenyon, J. Latham, Joyce Leach *A. D. Leigh, A. Manch, R. A. Martin, A. P. Massie, Asa Mills, *M. D. Milne, M. J. Parsonage, J. R. Platt, T. H. Redfern, J. C. A. Renshaw, E. Ridehalgh, W. E. Rigby, G. G. Robertson, B. Roditi, E. S. Rogers, M. S. Rowley, L. D. Rutter, J. E. Schofield, F. W. Taylor, G. K. Tutton, G. H. Whittle, A. F. Williams, R. M. Winston. *Pharmacology:* Eva Abrahamson, A. Ashworth, J. H. R. Barker, F. R. Brebner-Smith, I. C. Campbell, G. Caplan, Rachel Claiman, Margaret Clucas, Elisabeth J. Davy, I. Dickson, W. Dickson, H. Diggles, J. W. Emerson, G. R. Ferguson, J. G. Ferguson, *E. S. Frazer, R. J. Gampell, L. A. Gifford, Hilda R. Harris, H. Hassall, S. Haythornthwaite, B. L. Hoffman, Irene E. Howorth, Margaret Jacques, O. Janus, E. W. Jones, G. Lancaster, J. T. A. Lloyd, J. L. Maclean, W. Mellor, Elsie L. Mettam, C. Parish, K. C. Prausnitz, T. F. Redman, *F. Robinson, Margaret H. Roscoe, J. K. Steward, T. A. Taylor, Edith M. Thorp, A. L. Tulk, Ena M. Walmsley, Mary J. Walmsley, Elizabeth C. S. Williams, Joyce Worthington.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*Part II:* Eleanor B. Schill.

* With distinction.

UNIVERSITY OF EDINBURGH

A graduation ceremonial was held in the Upper Library Hall on December 17, when the following degrees were conferred:

M.D.—†J. A. Chapel, *R. V. Christie, F. L. A. Gacé (*in absentia*), W. Henderson, Helen McD. Hendrie (*née* McDougall) (*in absentia*), *T. B. Johnston (*in absentia*), W. M. McIntyre, W. R. H. Mackay, Jean MacD. MacLennan, W. R. Martine, R. C. M. Pearson, †A. Penman, L. V. Roberts, A. M. Ross, J. O. Weswater.

D.Sc.—T. B. Menon, M.D.

PH.D. (*Faculty of Medicine*).—A. Haddow, M.D.

M.B., CH.B.—C. A. Anderson, I. L. Briggs, P. E. Brown, A. G. Brownlie, J. A. Cooper, C. F. Coutts-Wood, Millicent C. Dewar, Frances H. Drew, A. El Shahed, A. Farquhar, M. Goldberg, A. Goldblatt, G. H. Hughes, W. Hunter, J. Hurwitz, A. Jeannacopoulo, R. W. Jones, R. D. Kennedy, R. Kerr, J. W. Leslie, D. P. Macmillan, I. A. G. McQueen, Robina M. Marwick, J. Miedema, J. Milligan, A. D. Mitchell, J. R. Moffat, W. A. Muir, W. G. Pollard, G. D. Roworth, J. Runcie, R. Saffley, R. L. Sanderson, G. Sawh, W. D'A. Silvera, I. F. Smith, Lesley I. Stewart, L. Teeluck, W. S. Thomson, F. L. Turner, B. C. Walker, R. B. W. Walker, P. Walton.

DIPLOMA IN PUBLIC HEALTH.—R. P. Jack, K. C. Mathew (*in absentia*).

* Awarded gold medal for thesis. † Commended for thesis.

Obituary

GEORGE A. BUCKMASTER, D.M., F.R.C.S.

Emeritus Professor of Physiology, University of Bristol

We regret to announce that Professor George Alfred Buckmaster, the distinguished physiologist, died at his house in Clifton, Bristol, on December 21, 1937, after some weeks of incapacitating illness.

He was born at Clapham on February 7, 1859, the second son of John Charles Buckmaster of the Science and Art Department, South Kensington. One of his younger brothers was the late Viscount Buckmaster, some time Lord Chancellor of England, and another is Mr. Martin A. Buckmaster, for many years head of the Art Department at Tonbridge School. George Buckmaster was sent to Magdalen College School, Oxford, and entered Magdalen College as a Science Demy at the age of 18. At the University he distinguished himself in the schools, obtaining a first-class in Natural Science in 1881 and the Burdett-Coutts scholarship in geology in 1882. He studied medicine at St. George's Hospital, and after qualifying in 1883 as M.R.C.S. won a Radcliffe travelling fellowship, which he held for three years. He graduated B.M. in 1885 and D.M. and B.Ch. in 1887, in which year he also took the Oxford D.P.H. During his tenure of the travelling fellowship he worked in physiological laboratories at Leipzig, Kiel, Göttingen, and Berlin. After a period of teaching and research at St. George's he was appointed professor of physiology at the Royal Veterinary College, London, and assistant professor at University College; and for many years served as examiner in physiology for the Primary Fellowship of the Royal College of Surgeons of England and for the medical degrees of the University of London. He was a member of the Leprosy Investigation Commission to India, 1890–1, and made contributions to the *Leprosy Investigation Journal* and to the report of the Commission. He wrote with Mr. J. A. Gardner many papers on the physiology of anaesthesia, blood gases in anaesthesia, rate of elimination of chloroform, and oxygen administration, which appeared in the *Proceedings of the Royal Society* and other journals from 1906 onwards. He also wrote on haemoglobin in the *Journal of Physiology*. Under the title of *The Morphology of Normal and Pathological Blood* Buckmaster published in volume form in 1906 a course of lectures which he had delivered at the Physiological Institute of London University. This book, which was by no means restricted to considerations of morphology, gave a detailed study of some of the latest methods of blood investigation at that time available. It included also an interesting account of an investigation of polycythaemia at high altitudes, which he had conducted in the Alps in conjunction with Dr. Charles Slater and the late Clinton Dent, his former colleagues at St. George's Hospital. Buckmaster devoted special attention to the vexed question of the origin and nature of blood platelets, and in discussing the clinical

pathology of the blood he protested against the excessive importance then attached to counts of red corpuscles, to the neglect of more instructive methods of investigation.

The last teaching post held by Buckmaster was that of professor of physiology in the University of Bristol. From his home in Victoria Square, Clifton, he often returned to London to attend meetings of the Physiological Society and renew friendships at the Savile Club, where he was a well-known and much-liked figure. On retirement from the chair at Bristol in 1929 he was elected emeritus professor, and in recent years made long voyages to oversea Dominions, in company with the late Professor William Wright, as travelling examiner for the Primary Fellowship. In recognition of these and many other services to the Royal College of Surgeons he was elected F.R.C.S. in 1934. He had long been a member of the Pathological Society and of the British Medical Association. A man of striking personality, with a vivid mind and an inexhaustible stock of ideas and phrases, his eloquence was almost a by-word among congenial companions. He was a good and faithful friend and a formidable adversary.

Mr. Gordon Gordon-Taylor, F.R.C.S., writes:

A multitudinous host of friends both at home and across the seas will deeply deplore the death of George Buckmaster, for he possessed that genius for friendship which is granted to all too few. A devoted and faithful servant of the Royal College of Surgeons of England, he twice made the journey to Australia and New Zealand when he had already exceeded man's allotted span, and only two years ago he visited India to conduct the physiology part of the Primary Fellowship examination in Calcutta. It was my privilege to be associated with him on the occasion of two visits abroad, and the pilgrimage with him on his second visit towards the Southern Cross strengthened the bond of friendship and augmented one's admiration for this marvellous old man. His contacts had always been many and wide, and I am sure that no more popular visitor has ever been a guest within the hospitable walls of the Melbourne or the Adelaide Clubs in Australia, or in the Wellington or any other of the Clubs in New Zealand where we were so warmly received and welcomed. He was blessed with a wonderful memory; and his brilliant conversation, the interesting anecdote about Victorian or Edwardian times, and the clever story could hold spellbound any audience comprised of any profession or rank. He was liked by all with whom he was associated; he was on respectful yet easy terms with Governors of State or Dominion; he was loved by the officers of the great College of Surgeons of Australasia, by his colleague-examiners as well as by the candidates. He was immensely proud of the Fellowship of the English College of Surgeons, which was conferred on him in the evening of his life. Death has broken an initial link that helped to forge the early friendship between the English College of Surgeons and that of Australasia. "C'est l'homme qui compte"; George Buckmaster, like William Wright who so recently predeceased him, did much to cement that liaison between these two great surgical colleges, sundered by so wide a waste of seas.

Atque in perpetuum, frater, ave atque vale.

A friend writes:

By the death of Professor Buckmaster Bristol has lost one of its most lovable characters. His personality was a unique combination of scholar and man of the world, bookman and clubman, and to those who were fortunate enough to share his interests he was able to reveal a fascinating charm and an erudition which was never ponderous. He had great power as a raconteur, and his knowledge of that interesting age of men and things termed Victorian enabled him to give an unforgettable picture of that London and those people which are no more. During the first half-century he had met many of the celebrities of his day, he had read much and travelled much, and all his impressions he was able to describe in a way which was as illuminating as it was amusing. I can recall many unforgettable evenings spent in his company when the pleasure was tinged with the regret that in this age of potted music and potted literature the inestimable advantages of conversation as an art and education were gone beyond recall. Professor Buckmaster hid his great love of his fellow creatures and his innate kindness and generous feeling behind a veil of amiable eccentricity, but his inner nature once discerned was an inspiration and a delight. With his passing a link has been snapped with an age which, with all its faults, produced not robots but individuals of whom he was such a notable example.

CHARLES SANDERS, M.B., M.R.C.S.

Late Medical Officer of Health, West Ham

Dr. Charles Sanders died on December 18 last at his residence in Ennerdale Road, Kew Gardens, in his seventy-ninth year. He obtained his medical education at St. Bartholomew's, and after holding posts at the Queen's Hospital, Birmingham, the London and India Docks, and the West Ham Hospital he was appointed medical officer of health to the county borough of West Ham; this became his life's work. He held the appointment for a long term of years with great distinction until he reached the retiring age at 65. A more happy and contented M.O.H. could not be met with, and to his intimates he was ever ready, from his extended experience, to exemplify how this and that difficulty could be surmounted. And to the writer he seemed perhaps even more happy and contented when he quitted official life, emigrated from the East to the West, and settled down in Kew, not omitting to recommend the move to his younger colleagues as it appealed both to himself and his dear wife.

Sanders was a staunch B.M.A. man, having been a member for fifty-five years, elected in 1882; he was president of the Metropolitan Counties Branch in 1923–4, a member of the Council 1923–5, a member of the Public Health Committee 1920–5, of the joint committee on minimum salaries for public appointments 1920–1, and of the superannuation subcommittee. He was also on several occasions a Representative at the A.R.M.; it was here where his quick wit and humour frequently intervened when apparent misunderstandings arose between preventive and curative medicine. Sanders was one who saw no room for misunderstandings; this was probably the keynote of his success.

In 1917–18 Charles Sanders was president of the Society of Medical Officers of Health. The opening words of his presidential address were typical of the man and his modesty. He said: "Disraeli is credited with the remark that when he wanted to read a good novel he wrote one. Would that I could apply this statement to a presidential address, with the eminent statesman's self-reliant assurance of resulting enjoyment, and this not more on my own behalf than yours, for I know how much more pleasant it is to listen to one who wants to speak because he has something to say than to one who has to say something because he wanted to speak." The address dealt with the Prophylaxis of Venereal Disease, and unlike most similar

addresses was intended to open a discussion. The subject was much in the air at that time, and the meeting was a notable one in the history of the Society; Sir James Crichton-Browne, Sir Frederick W. Mott, and Miss Ettie Rout among others took part. One of his first presidential duties was to head a deputation to the President of the Local Government Board (Mr. Hayes Fisher) in favour of better co-ordination of the public health services by the appointment of a Minister of Health.

There are many who will greatly miss the cheery word and countenance of Charles Sanders, who for so long had been a stalwart in the Public Health Service.

E. H. S.

Dr. CECIL ERNEST JONES-PHILLIPSON, who died on November 13 at Capetown, aged 67, was a student of St. Bartholomew's Hospital, and took the English Conjoint diplomas in 1896, obtaining the F.R.C.S.Ed. and the M.D.Brux. in 1903. He settled in South Africa soon after qualification, and practised at Port Alfred from 1906 to 1916. He then went on active service to France with a commission in the R.A.M.C., and served as an aural specialist to the British Expeditionary Force. After the armistice he returned to South Africa and started practice as an ear, nose, and throat specialist. Dr. Jones-Phillipson joined the British Medical Association in 1898. He was president of the Cape of Good Hope (Eastern Province) Branch in 1906 and president of the Cape Western Branch of the Medical Association of South Africa (B.M.A.) in 1924–5. He published several papers on oto-rhino-laryngological subjects in the *South African Medical Journal*.

We regret to announce the death of Dr. JAMES MCKAY of Coatbridge on December 9 after a short illness. A native of Dumbarton, Dr. McKay graduated M.B., C.M. in 1892 and M.D. in 1911 at Glasgow University. He practised in Coatbridge for about forty years as a general practitioner, was an active member on the staff of the Alexander Hospital, Coatbridge, and retained that connexion until a few years ago. For the past thirty-six years he had been a member of the British Medical Association. Dr. McKay was a man of outstanding character, quiet and unassuming, who devoted his whole life to the interests of his patients and profession. He was held in high esteem by his professional colleagues, and his death is deeply regretted by a wide circle of friends.

On October 30, 1937, aged 63, there passed away in the person of Mr. HARRY HOLMES, B.A., M.B., B.Ch., one of the best friends of the voluntary hospital system of Merseyside. Springing from sturdy yeoman stock in Lincolnshire, he had all the good qualities of the typical Englishman, sharing also the reticence and self-effacement. From St. John's College, Cambridge, he entered St. Bartholomew's Hospital, and graduated in medicine in 1896, and early in his career became associated with the Wigan Infirmary as junior and then as house-surgeon. Appointed in 1904 to the honorary staff of the Eye and Ear Infirmary, Myrtle Street, Liverpool, he spent the best of his life, health, and energy in unostentatious work in Wigan as ophthalmic and aural surgeon. Mr. Holmes (writes C. A. H.) was a brilliant chess player who held many championships; he nevertheless put his duty to his work first; and, indeed, there were few who maintained a more consistent level of all-round good results in his clinical work year in, year out. Joining the North of England Ophthalmological Society as a foundation member in 1914, he served on its council in 1925, and he had been a member of the British Medical Association for the past twenty-seven years. His skill and ability often went unnoticed, so modestly was it tendered; but it was on the point of character that he will be best remembered by his medical friends as one "more skilled to raise the wretched than to rise."

Medical Notes in Parliament

In the House of Lords, on December 22, a Royal Commission, consisting of the Lord Chancellor, Viscount Dawson of Penn, and Lord Stanmore, signified the Royal assent to the Air Raid Precautions Act. On the same day the Unemployment Insurance Bill, which has passed the House of Commons, was read a first time, the Criminal Procedure (Scotland) Bill was presented by Mr. Elliot and read a first time, and the Dogs Act (1871) Amendment Bill, which is introduced by Sir Robert Gower, a second time. The Criminal Procedure Bill is to amend the law of Scotland relating to criminal procedure and to incest and to fatal accident inquiries.

A motion was adopted by the House of Commons on December 22 which called for further measures, including more strict and uniform administration of the Shops Acts, to raise the conditions of employment in the distributive trades.

Mr. Elliot announced on December 22 that it had been decided to appoint a representative committee to review the whole field of public health law and local government law in Scotland and to prepare the necessary measures for its revision and consolidation. Sir John Jeffrey had been appointed chairman of the committee.

The House of Lords adjourned on December 22 till February 1, and the House of Commons on December 23 to the same date. Provision was made for an earlier summoning of Parliament in the event of urgent need. On February 1 the House of Commons will take the committee stage of the Population (Statistics) Bill and will further consider the Blind Persons Bill.

A motion to set up the projected committee on road accidents will be among the earliest business of the House of Lords after its reassembly.

Inquiry into Tuberculosis Services in Wales

Sir KINGSLEY WOOD told Mr. Jenkins, on December 22, that the report of the committee of inquiry into the anti-tuberculosis services in Wales and Monmouthshire was not completed. Bodies who wished to give evidence before the committee were asked to complete and submit a written summary of their evidence before the end of the year. The committee hoped to hold a public sitting in Cardiff early in the New Year. Further sittings would be necessary. He would consider publication of the report as soon as he received it.

Ophthalmic Benefit

SIR KINGSLEY WOOD announced on December 23 that ophthalmic benefit was included among the additional benefits available to the members of 730 approved societies and 4,700 branches, with a total membership of 11,300,000. Members of these societies became entitled to the benefit after a waiting period of 2½ years on average, but after the completion of the waiting period the benefit was available to all classes of members. Legislation to make ophthalmic benefit available to all members of all approved societies could not at present be contemplated.

Leprosy Incidence and Treatment

Sir KINGSLEY WOOD, in a reply to Mr. Messer on December 23, said cases of leprosy were not required to be reported to his Department, but he had information of thirty-eight such cases in this country. In only four over a long period of years was it considered that the infection was incurred in this country. In each of these there was a history of prolonged and intimate contact with a person who contracted the disease abroad.

There was only one colony for twelve patients suffering from leprosy in this country. As prolonged and close contact with an infected person was necessary for the transmission of this disease the risk of transmission in the conditions normally existing in this country was negligible. A Middlesex patient about whom Mr. Messer asked was now in a London hospital, and she would be admitted to the colony as soon as a bed was available. The local authority in whose area the patient resided was prepared to make a substantial contribution to her maintenance. Steps were being taken by the managers of the colony to raise voluntary funds for an extension of the accommodation.

Typhoid in s.s. "Strathaird"

In reply to Mr. James Hall on December 23, Sir KINGSLEY WOOD said there was an outbreak of typhoid on board the s.s. *Strathaird* on her last homeward voyage in October. It did not appear that any passengers suffering from typhoid were landed at Marseilles. The members of the crew were not inoculated. The names and addresses of the 329 passengers and of the 233 European members of the crew were sent by the London port health authority to the medical officers of health of the districts of destination. Three passengers and two members of the crew gave addresses in Croydon. These were followed up, and were reported by the local authority to have remained in good health. The drinking-water on this ship was adversely reported on when she arrived at Aden. In consequence the water in all the tanks was chlorinated. On arrival at Tilbury instructions were given that all fresh-water tanks should be emptied, cleansed, and cement-washed, and then refilled from the quay hydrant and the water chlorinated. Precautions were taken to the satisfaction of the port health authority to prevent tainted water being pumped into a tank which had been cleansed.

Sir Kingsley Wood further explained on December 23 that notifications of carriers of disease were not included among notifications of disease sent to his department. The statutory obligation to send notice of disease to the medical officer of health of the district concerned related only to persons suffering from the disease. Only such persons were appropriate for admission to an isolation hospital. Persons known to be potential sources of infection but not showing any clinical symptoms of disease should be normally the subject of appropriate precautionary measures at home.

Treatment of Prisoner in Barlinnie Prison

Mr. ELLIOT told Mr. McGovern on December 23 that he had investigated the treatment of a prisoner in Barlinnie Prison, Glasgow, on September 10, 1937, and had that week interviewed the medical superintendent of Gartloch Asylum. After the man had become violent in his cell on September 10 a struggle occurred with warders and he was certified by the assistant medical officer and by another doctor to be of unsound mind. The man, who made no complaint to the governor that he had been ill used, was removed to Gartloch Asylum and was examined there by the assistant medical officer, and on the following day by the medical superintendent. On September 17 the medical superintendent of this asylum certified the man to be of unsound mind. On December 9 the man was fully examined by a deputy commissioner of the General Board of Control, who reported that he was still convalescent from maniacal excitement amounting to certifiable insanity, and should be detained for some time. Since then the medical superintendent had informed Mr. Elliot that he could not at present recommend the liberation of the man, even on probation. Mr. Elliot said that he was satisfied the man's certification on September 10 and his subsequent detention in Gartloch were fully justified by the facts as known to the medical officers concerned.

There was no evidence that he was subjected to force or restraint beyond what was necessary. Consideration of the case had, however, shown the desirability of ensuring that if a prisoner whose sanity was in doubt became violent the medical officer, or in his absence the prison governor, should be present from the earliest possible moment. Directions had been given accordingly. Where force had to be used against a prisoner and he was bruised or wounded a report would in future be made to the chairman of the visiting committee as well as to the Prisons Department.

Subsequently Mr. MCGOVERN opened a debate on this case, and Mr. MONTAGUE asked for an inquiry. Mr. ELLIOT replied that no further inquiry could now bring out relevant facts.

Mortality of War Pensioners

On the motion for the Christmas adjournment on December 23 Mr. F. O. ROBERTS discussed ex-service men's pensions. He said the death of 51,000 pensioners between 1929 and 1936 showed a mortality rate of 16 per cent. among ex-service men, compared with a rate of 7.6 per cent. for males of similar age among the general population. The time was opportune for a complete survey.

Dr. HADEN GUEST said a review should be undertaken of cases where men had neglected to apply for pensions after the war but had subsequently broken down with maladies such as neurasthenia.

Mr. H. RAMSBOTHAM said there was no evidence of general discontent, and he could see no case for an inquiry. It would be impossible to remodel the pensions scheme. The percentage death rate among pensioners was 15.5, compared with 10.5 for the civil population. That was 45 per cent. above the rate for the civilian population for the same age, whereas in the United States the excess was 71 and in South Africa 77. The lower figure in the United Kingdom was attributable to the wonderful health services. He had an open mind about the British Legion inquiry into the question of the prematurely aged ex-service man. He could not now tell the House that there was no such thing as premature ageing by war service.

Fatal Encephalitis following Vaccination.—On December 21 Mr. LEACH asked the Secretary of State for War whether he was aware that Cyril Francis Youngman of Charlton, aged 14, died from encephalitis resulting from vaccination, on December 2, the vaccination having been undergone so that the lad could take up a situation at Woolwich Arsenal; that the Minister of Health, in his recent annual reports, had recommended that children of school age and young adults should not be primarily vaccinated unless in special danger of small-pox, as this operation might cause or activate encephalitis; and whether, in view of this case, he would abolish the regulation requiring certain workers at Woolwich Arsenal to be vaccinated. Mr. HORE-BELISHA said that he had been made aware of the unfortunate circumstances in which this lad died. Such cases were very rare, but he was considering whether the present regulation requiring the vaccination of entrants to the Royal Arsenal should be relaxed. Replying to Mr. Kelly on the same date, Mr. Hore-Belisha said that before an employee was engaged at the Royal Arsenal he was required to be vaccinated. As the vaccination was done by his own private arrangement, he had no information whether any case had resulted in the death of the man vaccinated.

Investigation into Prevention of Silicosis.—On December 21 EARL WINTERTON informed Mr. J. Griffiths that the progress of the investigation conducted by a group of scientists at the McIntyre Mine, Ontario, Canada, into the possibility of the prevention of silicosis by the admixture of metallic aluminium with silica dust was being followed with interest by the special committee advising the Medical Research Council in this subject. Some experiments on similar lines had already been initiated in this country.

Appointment of Salaried Midwives.—On December 21 Mr. BERNAYS, replying to Sir Robert Young, said that the number of salaried midwives included in the proposals of local authorities under the Midwives Act, 1936, was approximately 7,550. It was safe to assume that a large majority of the midwives had already been appointed. Returns showing the exact numbers appointed by the end of this year would be available next February. The Minister of Health was not aware that any serious difficulty had been experienced in any part of the country in securing the requisite number of midwives.

EPIDEMIOLOGY AND VITAL STATISTICS

No. 50

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 18, 1937.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Irish Free State. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 125 great towns (i) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns (ii) in the Irish Free State. (e) The 10 principal towns (iii) in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1937					1936 (Corresponding Week)					1928-36 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	24	2	5		—	17	5	8	1	—		
Deaths		—	2				1	1				
Diphtheria	1,568	201	183	63	34	1,283	162	244	44	63	1,302	217
Deaths	49	6	4	3	1	43	—	6	3	1		
Dysentery	411	127	43			36	7	17				
Deaths				—	—				—	—		
Encephalitis lethargica, acute	2	—	—		—	5	—	1		—		
Deaths		1					1					
Enteric (typhoid and paratyphoid) fever	24	1	3	15	2	27	—	6	5	1	27	—
Deaths	6	—	—	—	—	2	—	—	1	—		
Erysipelas			91	9	9			75	8	5		
Deaths		1					1					
Infective enteritis or diarrhoea under 2 years	57	15		8	2	44	14		5	—		
Deaths												
Measles			427		279*			105		2		
Deaths	22	—	8	2	4	2	—	—	1	—		
Ophthalmia neonatorum	89	8	35		—	84	8	26		1		
Deaths												
Pneumonia, influenzal	1118§	124	21	6	9	851§	95	15	—	8	997	106
Deaths (from Influenza)	52	11	12	4		54	11	9	—			
Pneumonia, primary			404	18				378	10			
Deaths		30					17					
Polio-encephalitis, acute	1	—				—	—					
Deaths		—				—	—					
Poliomyelitis, acute	10	1	—		—	12	2	—		—		
Deaths		—					—					
Puerperal fever	†	1	25	1	—	34	4	25	4	2		
Deaths		—					1‡					
Puerperal pyrexia	152	9	21		—	97	10	25		3		
Deaths		—					—					
Relapsing fever	—	—	—			—	—	—				
Deaths												
Scarlet fever	2,565	159	505	82	81	1,906	173	368	102	64	2,504	325
Deaths	4	—	1	—	—	7	1	—	1	—		
Small-pox	—	—	—		—	5	—	—		—		
Deaths	—	—		—	—	—			—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough			46		5			323		11		
Deaths		8	1	—	2		—	9	6	1		
Deaths (0-1 year)	444	92	100	38		355	70	86	46			
Infant mortality rate (per 1,000 live births)	74	76				57	58					
Deaths (excluding stillbirths)	5,881	129	858	245	170	4,973	956	801	222	131		
Annual death rate (per 1,000 persons living)	14.5	15.2	16.7	16.7	15.1	12.4	11.9	15	15.4	12.5		
Live births	6,037	1,195	804	325	240	5,614	1,082	842	300	227		
Annual rate per 1,000 persons living	14.9	15.0	16.4	22.2	21.3	14.0	13.5	17.3	20.9	21.7		
Stillbirths	294	38				279	45					
Rate per 1,000 total births (including stillborn)	46	31				47	40					

(i) 122 great towns in 1936
(ii) 12 „ „ „
(iii) 9 „ „ „

* 271 cases in Belfast alone
† All cases notified as puerperal pyrexia after October 1, 1937

‡ Death from puerperal sepsis
§ Comprises primary and influenzal forms

EPIDEMIOLOGICAL NOTES

Typhoid Fever.—The number of cases notified in the Croydon epidemic at the time of going to press was 289, with 31 deaths. It will be observed that for the week ended December 18 there were 24 notifications of enteric fever; the "expected" figure based on the median value for the last nine years was 27, the figure which was returned for the corresponding week last year.

Measles.—Measles is not generally notifiable in the British Isles. In some areas in which notification is in force only the first case in a household is required to be notified unless a period of two months intervenes. Reports of absences from school on account of measles only partially fill the gap, as measles is essentially a disease of children under school age in large centres of population. In Scotland and Northern Ireland notifications suggest that an epidemic is in progress at the present time. Measles is expected in London this year according to the law of biennial periodicity in densely populated areas, and already some boroughs, notably Fulham, in London have reported large numbers of cases. The weekly number of deaths from measles provides a fairly reliable guide to the prevalence of the disease; it is evident that the figures for the deaths from measles in our table reflect the prevalence of the disease two to three weeks previously.

Medical News

A meeting of the West London Medico-Chirurgical Society will be held at the De Vere Hotel, Kensington Road, W., on Friday, January 7, at 7.45 p.m., when there will be a discussion on "Sterility," to be opened by Messrs. Eardley Holland, Kenneth Walker, V. B. Green-Armytage, and F. J. McCann.

A meeting of the Society for the Study of Inebriety will be held at 11, Chandos Street, W., on Tuesday, January 11, at 4 p.m., when papers will be read by Dr. W. Norwood East on "Some Official Contacts with Addiction (National)" and by Major W. H. Coles on "Some Official Contacts with Addiction (International)." A discussion will follow.

A discussion on "Recent Advances in Methods of Bed-bug Disinfestation" will take place at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., on Tuesday, January 11, at 5.30 p.m. Mr. S. A. Ashmore and Dr. B. T. J. Glover will open the discussion, and a demonstration of the methods described will be given by Dr. J. Macmillan.

The tenth annual Congress of the Egyptian Medical Association will be held at Baghdad from February 9 to 13, when the following subjects among others will be discussed: surgery of the liver and gall-bladder, malaria, cholera, and undulant fever. The subscription is one Egyptian pound. Further information can be obtained from the General Secretary, Kasr-el-Aini, Post Office, Cairo.

At the annual meeting of the Save the Children Fund, whose offices are at 20, Gordon Square, W.C.1, Lord Noel-Buxton stated that the basis of its work at home and abroad was the Declaration of the Rights of the Child (Declaration of Geneva), to which the Prime Minister had recently given his approval. Sir Francis Fremantle said that the Fund in its work in this country was helping to protect from the worst evils the sensitive minds of children and the bodies they controlled. It was also helping to fill a gap in the public health services for "toddlers," aged 2 to 5, by the provision of nursery schools, particularly in the special areas. Dame Rachel Crowdy commended the work of the Fund for the victims of the war in China. Lord Snell, chairman of the London County Council, said that one of the Fund's principal claims to support was that in setting out to help a child it took into consideration neither his race nor the religious convictions of his parents.

At a meeting of the Governing Body of University College Hospital on December 16 it was announced that Sir Herbert Samuelson, the former chairman and treasurer of the hospital, had made a gift of £10,000 towards reduction of the debt on the building fund. The debt, amounting to £200,000, was incurred as the result of the building of the private patients' wing and sisters' home, and extensions to the ante-natal and child welfare departments.

The issue of the *South African Medical Journal*, the organ of the Medical Association of South Africa (B.M.A.), for November 27, 1937, is a special tuberculosis number, with an account by Sir Edward Thornton of the policy of the Union Public Health Department for dealing with tuberculosis in South Africa. Other contributors are Drs. D. P. Marais, Strafford Hewitt, P. Allan, J. A. Macfadyen, W. H. Horne, and A. Bloom. Surgical tuberculosis is deferred to a later occasion, the present articles dealing solely with the medical side of the problem.

The issue of the *Bulletin de l'Office International d'Hygiène Publique* for October, 1937, is devoted to plague in the French colonies, India, and Tunisia; infantile paralysis in the United States, Italy, New Zealand, Sweden, and Jugoslavia; and cerebrospinal fever in the United States and Turkey.

The issue of *Paris médical* for December 4 is devoted to therapeutics; that of the *Journal de Médecine de Lyon* for November 20 to legal and social medicine; and that of *Le Bulletin Médical* for November 27 to paediatrics.

Mr. E. W. Meyerstein has given to St. Mary's Hospital £32,576 for the purpose of acquiring the freehold of a site of 10,500 square feet adjoining the hospital in Praed Street, Paddington, thus providing land needed for the extension of the hospital. In appreciation of this and his earlier gift of the Meyerstein Dental Research Laboratory at St. Mary's, Mr. Meyerstein has been elected a vice-president of the hospital.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

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The TELEGRAPHIC ADDRESSES are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Frumenty

Dr. ARCH. R. MILLER (Glasgow) writes: In the *Journal* of December 18 Dr. Josiah Oldfield urges the use of "frumenty" for the prevention of constipation in "normal human beings." Would it be convenient for Dr. Oldfield to supply the recipe for "frumenty" to one of the conquerors who is not above learning if possible from the conquered?

*** "Frumenty" and "furmety" are alternative names for a sort of porridge made with hulled wheat boiled in

milk and seasoned with cinnamon, sugar, etc., which was popular as an English dish in former times. The name is derived from *frumentum*, Latin for corn. Dr. Lionel Picton or Dr. Oldfield will no doubt be able and willing to give details of how to prepare frumenty. We have had inquiries from several readers.

Painful Tongue

Dr. R. D. MOYLE (Eastbourne) writes in reply to "Worried" (*Journal*, December 18, p. 1259): In the past month I have seen two patients (females) who complained of this "burning pins and needles" affecting the tongue. In one case nothing abnormal was seen, while in the other there was a mild erythema over the anterior part of the tongue. Microscopical examination of a scraping in this second case showed a monilia-like fungus, but this is not uncommon in the mouth. A pigment containing liq. arsenicalis, tinct. ipecacuanha, and glycerine, one drachm of each to an ounce of aqua menth. pip., well rubbed in with cotton-wool on a match-stick three times daily, has been successful in clearing up the complaint.

Incapacitating Diarrhoea

Dr. VICTORIA H. KING (Birmingham) writes in reply to "Emdee" (*Journal*, December 11, p. 1206): The morning diarrhoea suggests to me pancreatic deficiency. If so, it would be relieved by enteric-coated pancreatin tablets. I have found Parke, Davis's efficacious in a similar case.

Dr. W. M. M. JACKSON (Folkestone) also writes: I would suggest to "Emdee" that he should stop smoking and take twice daily in a little water 30 minims of mist. bismuth. c pepsin. If this is ineffective an analysis of the faeces might be of value.

Income Tax

Sale of Book Debts

"PERPLEXED" bought a practice as from January 1, 1936, and sold it as from December 31, 1936. The cash receipts were £2,000 and the outstanding debts, amounting to £1,000, were sold for £600. What should be regarded as the amount of the gross receipts of the practice for 1936?

*** The answer is £3,000 less such an amount as can be deducted from the £1,000 book debts for anticipated losses by bad and doubtful debts. Clearly there would be some loss, but the allowance is not necessarily as much as £400—the difference between the gross amount and the sum received on the lump sum sale. That form of realization has special features—for example, anticipation in point of time and saving of cost of collection—for which no allowance can be claimed. The correct basis of calculation would be to draw up a schedule of the debts at December 31, 1936, and value each one on the question of recoverability; the aggregate of the differences would be the amount by which the £3,000 can be reduced to represent the gross receipts.

LETTERS, NOTES, ETC.

Subcutaneous Emphysema during Labour

Mr. VAUGHAN PENDRED, F.R.C.S. (Tilford, Surrey), writes: In connexion with the case reported by Dr. F. H. Nussbaum in the *Journal* of December 11 (p. 1169), I should like to record that of a relative of mine, aged 25. For the last three months of gestation she had been severely dieted for albuminuria. The baby, her first, was born normally, and the doctor in attendance went home to breakfast. Three hours later the patient's husband called me up to report that there was a swelling of his wife's left face and neck. On my suggestion he palpated it and found that the area "crackled" when he pressed it. A consultant was called, who found that the emphysema affected the left arm and a considerable part of the left side of the body. In a few days the air had been absorbed, the albuminuria disappeared, and the patient returned to her usual excellent health; two years later a second healthy son was born. Some years before the first pregnancy a mass of tuberculous glands was dissected from the right side of her neck. We thought that a small tuberculous infiltration had occurred in the left lung, sealing the overlying pleura, and had ruptured into the subcutaneous tissues during the straining of delivery.

Dr. P. PHILLIPS (Bristol), in connexion with Dr. Nussbaum's memorandum, writes: This unusual happening is certainly one of the rarer accidents of labour, for in over 3,000 maternity cases delivered in the Southmead Hospital under my supervision, between 1923 and 1932, it was not observed in a single case. However, from 1932 to 1936 five such cases have been recorded out of 3,650 deliveries. All the patients were young primiparae, aged 18, 18, 19, 21, and 21 years, and delivery was normal. Their efforts during the second stage of labour might be described as unusually vigorous, and in each case restlessness was noted. In four of the patients emphysema did not develop until after the completion of labour, while the fifth complained of a sudden pain in the right side of the chest and face about forty minutes before the actual delivery. This was followed by rapid swelling of the right side of the face and neck, the right eyelid becoming swollen first; delivery was taking place in the left lateral position. About twelve hours later the emphysema had extended down the neck and chest to the level of the breasts, but still remained more marked on the right side. All five made uninterrupted recoveries, though the pulse rate usually remained rapid at about 90 to 100 for some seven days. I have photographs of one case and a short cinematographic record of the day-to-day recovery in another. With regard to the aetiology of this condition, all my cases were examined for carious teeth or possible abnormal communications between the mouth and nasal sinuses; none was found. In no case was there a history of chest trouble or tuberculosis; *x*-ray examinations of the chest were made within twenty-four hours of the onset of the emphysema, but no evidence of pneumothorax was found. Consequently it seems unlikely that the condition resulted from rupture of air vesicles in the lung, unless at some point very near to its root. In the straining of labour it would appear that the glottis must be closed during the act of bearing down. Consequently one would imagine that the escape of air most probably takes place at some point between the root of the lung and the glottis, whence it tracks up through the mediastinum and usually appears first on the face. In my opinion a tenable theory is that in a few rare cases there is some anatomical weakness or deficiency in the structure of the trachea or bronchi. Straining produces a slit-like rupture in the wall which, acting as a valve, allows the intermittent escape of small quantities of air into the mediastinum. This would also account for the cases in which emphysema does not appear until labour is complete. Obviously such a theory is difficult of proof, but with continuous observation and interest a satisfactory explanation may be found. The first case I witnessed caused me considerable alarm, but it is some consolation to know that the prognosis is invariably good and the swelling disappears in a few days without treatment.

Herpes and Varicella

Dr. I. H. LLOYD-WILLIAMS (Southport) writes: The relationship between herpes zoster and varicella is one that is ventilated in the *Journal* from time to time but apparently without any definite conclusions being arrived at, except that they are both virus diseases. The following notes of cases are forwarded as a further small contribution to the problem. I have had lately under my care a man of 65 who on November 10 developed herpes zoster of the second and third left sacral nerves, the eruption affecting the back of the thigh and side of the scrotum and penis. On November 25 his grandson, who lives in the same house, developed a typical varicella. These dates agree with the incubation period of chicken-pox. I met, about ten years ago, a somewhat similar coincidence, where the child had varicella and the mother, who had nursed her, developed herpes. These cases, and similar ones which have been noted in the *Journal* before, suggest that the disease which is developed by the transmitted virus depends on the soil as to whether the infection becomes general or local. It is unusual for a second attack to occur or for the same patient to have both diseases. In view of the latter it is perhaps worth recording that as a child I had chicken-pox and about ten years later at school I had herpes zoster. Accepting the theory that it is the same virus causing both diseases, one wonders whether in my own case the immunity developed from the first attack was not quite complete, and that with a second infection (source unknown) only a local manifestation was produced. An alternative that occurs to me is that there may be different strains of the same virus causing the two diseases.